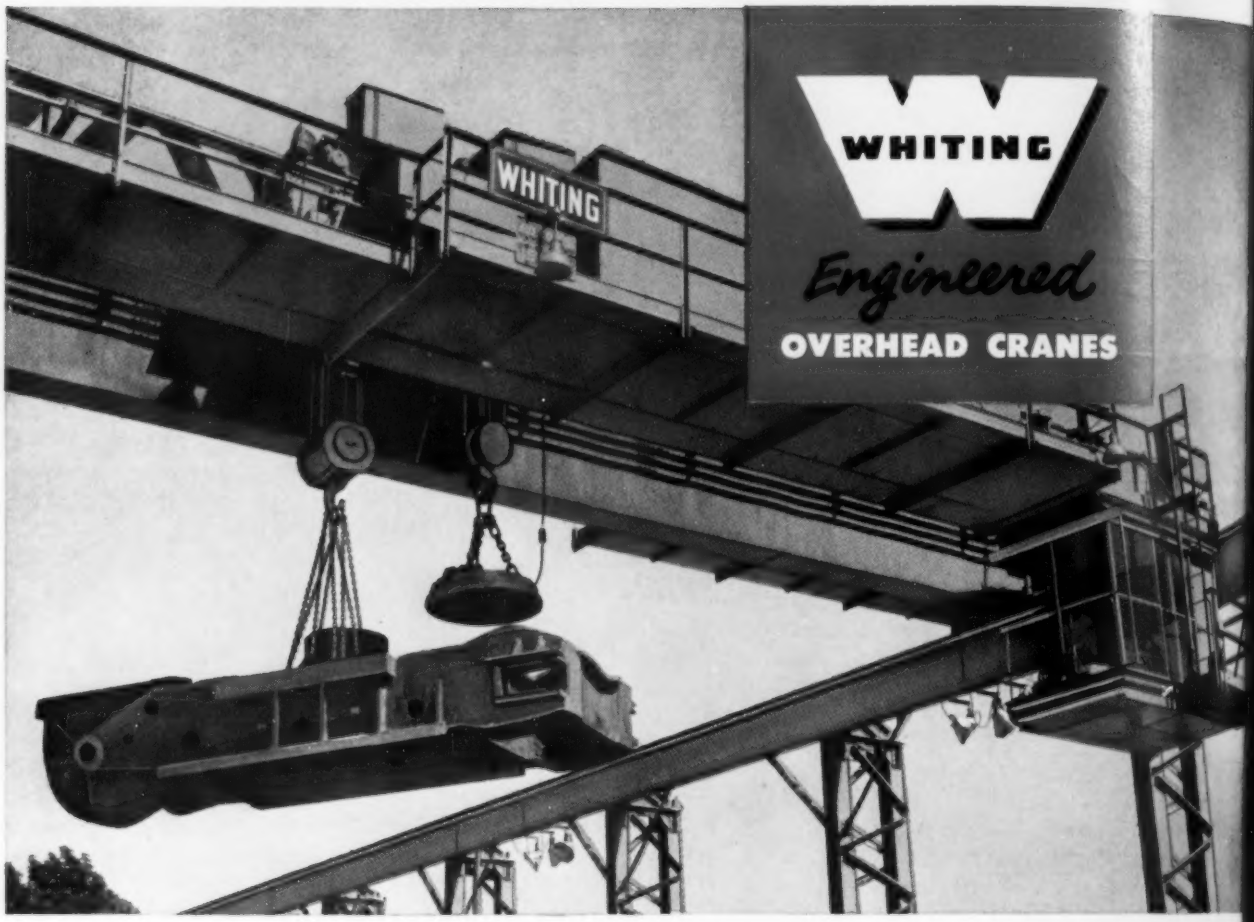
A CHILTON PUBLICATION

The Iron Age

ATERIALS HANDLING ISSUE — May 7, 1953

TENTS PAGE 2

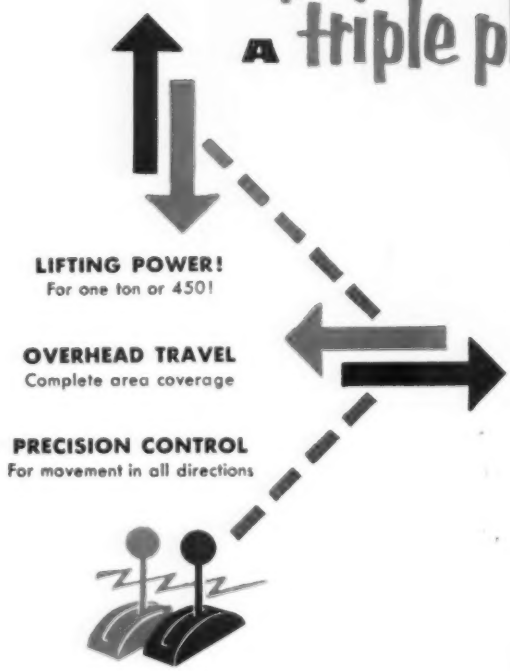


WHITING

Engineered

OVERHEAD CRANES

A "triple play"... THE WHITING WAY!



LIFTING POWER!
For one ton or 450!

OVERHEAD TRAVEL
Complete area coverage

PRECISION CONTROL
For movement in all directions

A Whiting crane lifts this huge casting into the air, moves it safely and surely through space, sets it down with precision control . . . makes the "triple play" that scores big with men who like championship action in handling.

What is it that makes a Whiting crane almost human . . . why is it so often the star on industry's handling teams? The answer is *Whiting engineering.*

At Whiting, crane engineering is more than a blue print. It offers a thorough understanding of your handling problems *plus* the skill, experience and resources to help you solve them with maximum efficiency at lowest cost. That's why it pays to talk cranes with Whiting first!

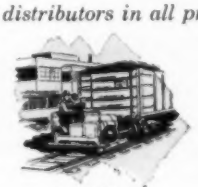
WHITING CORPORATION

15601 Lathrop Avenue, Harvey, Illinois

Sales offices and distributors in all principal cities

Whiting Serves All Industry

Electric Chain Hoists



The Whiting Trackmobile

Trambeam Overhead Handling Systems

Whiting Corporation also manufactures Railroad, Foundry and Aviation Equipment; Swenson Equipment for the Chemical Process Industries and Metal-Working Machinery.

IN FOR A LIFE OF HARD LABOR

Shown here are several types of Bethlehem rolled-and-forged circular blanks which are, as you can see, very sturdy specimens. They will be used in different kinds of work, but one and all, they are in for a life of hard labor.

These blanks, and all similar blanks made by Bethlehem, are strong and homogeneous — strong, tough steel from rim to rim. You'll find them perfect for gears, crane wheels, sheave wheels, turbine rotors, flywheels, and other rugged parts that work day in, day out under very heavy loads.

A special process involving both rolling and forging produces uniform density of metal and an excellent grain flow. As a result, something more than strength is achieved. Because of the firm, solid steel all the way through, the blanks machine dependably and easily, with no hidden trouble down beneath. No flaws that can mean discarding a piece after expensive preliminary cuts have been taken.

And speaking of machining: we furnish the blanks rough-machined, so that there's a minimum of finishing work for you, the customer.

Bethlehem circular blanks are available untreated or heat-treated, in sizes ranging from approximately 10 to 42 in. OD. Ask for particulars—or write for a free copy of illustrated Booklet 216.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM ROLLED-and-FORGED CIRCULAR PRODUCTS

The Iron Age

Vol. 171, No. 19, May 7, 1953

* Starred items are digested at the right.

EDITORIAL

What About Steel Prices? 7

NEWS OF INDUSTRY

*Special Report: Less Handling the Better 139
*Marketing: Steel Prices Going Up 141
*Management: Paint Plants Scientifically 142
*Manufacturing: Stamping Market Shifts 145
*Labor: Steelworkers Plan for Future 146
Raw Materials: Zinc Men Meet 147
*Financial: Steel Earnings Higher 150
*Expansion: Set Up Huge Extrusion Press 151
Personnel: Iron Age Salutes 191
Iron Age Introduces 193
Clearing House 320

NEWS ANALYSIS

Newsfront 137
*Automotive Assembly Line 156
*This Week in Washington 161
West Coast Report 165
*Machine Tool High Spots 167

TECHNICAL ARTICLES

*Materials Handling 199

A special 40-page section on latest developments in this field featuring savings in time, money and labor.

Technical Briefs on Materials Handling 240
Program of Materials Handling Show 274
Exhibitors in Materials Handling Show 279

MARKETS & PRICES

*The Iron Age Summary—Steel Outlook 287
Market Briefs 289
*Nonferrous Markets 290
Iron and Steel Scrap Markets 294
Comparison of Prices 298
Steel Prices 300

REGULAR DEPARTMENTS

Dear Editor 9
Fatigue Cracks 11
Dates to Remember 13
Free Publications 171
New Equipment 176

INDEX OF ADVERTISERS 335

THE IRON AGE, published every Thursday by the CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries, $15, other Foreign Countries, $25 per year. Single copies, 35¢. Annual Review and Metal Industry Facts Issue, $2.00. Cables: "Ironage," N. Y.

Address mail to 100 E. 42 St., N. Y. 17, N. Y.

Digest of the Week

NEWS DEVELOPMENTS

MATERIALS HANDLING: THE LESS THE BETTER—P. 139
Materials handling provides the greatest potential area for reducing production costs. The past 7 years have seen vast improvement in methods. Value of handling equipment produced this year is expected to hit $1.2 billion—more than double the 1947 total. And further expansion is expected.

HOW TO PAINT YOUR PLANT SCIENTIFICALLY—P. 142
When a progressive manufacturer brought daylight lighting into his shop he got the wrong results. He had considered only lighting—not lighting in harmony with color. A color engineer was called in to solve the problem. Many benefits can be had through proper color on walls, machinery, equipment.

STEELWORKERS PLAN STRETCH INTO FUTURE—P. 146
If you listen closely, you can hear the United Steel Workers whispering to the steel industry: "Wait 'til next year." They will fight hard for a wage boost this year—but they're in no mood for a strike. Policy statement spells out long-term aims for a guaranteed annual wage, broad social gains.

SET UP HUGE EXTRUSION PRESS IN 4 MONTHS—P. 151
Installation of the nation's largest extrusion press at Alcoa's Lafayette, Ind., plant marks an important step in the heavy press program. The 14,000-ton German-built titan was erected in only 4 months despite the need to translate metric calibrations. Heavy presses could revolutionize some fabrication.

MOSCOW SWEET TALK WON'T IMPRESS IKE—P. 161
"Threat" of peace by no means spells any major let-up in government defense buying—nor does it mean the end of the draft. Defense spending will be cut $5 billion now. But output will be stretched out over longer period of preparedness. More congressmen are siding with the President on taxes.

PRESSURE ON AUTO TOOLING SEEN EASING—P. 167
Speed-up of auto engine programs anticipated as defense cutbacks ease pressure on machine tools. Cancellations of jet engine programs underline decreasing importance of government buying to machine tool business. More cancellations are expected. General Electric stretches out its jet engine output.

in Metalworking

Special Issue

MARKETS & PRICES

STEEL PRICES MOVING HIGHER ON MOST ITEMS—P. 141
Steel price extra changes now being made will eventually take in virtually all tonnage products of the industry. Base prices may go up later. Producers are reluctant to estimate the increases in dollars and cents. But steel items must pay their own way. May cause shift in buying patterns.

STAMPING MARKET SHIFTING FROM MILITARY—P. 145
Metal stampers have better backlogs than last year—but they are beginning to worry about fourth quarter business. Buying by the Armed Forces has dropped about 10 pct. But civilian demand is high. Success of auto salesmen will help determine future market. And auto production holds key to suppliers.

EARNINGS OUTLOOK BRIGHTENS FOR STEEL — P. 150
It seems a cinch that steel industry earnings this year will top 1952. Main factors: First quarter net was 22.8 pct higher; tax relief may come; recent boosts in extras raise profit potential; demand is soaring; base prices will go up with a wage hike; and no strike is expected this year.

AUTO EARNINGS CLIMB IN FIRST QUARTER — P. 156
Sad notes reflected in 1952 annual reports in the auto industry were drowned out by jubilant tones of first quarter reports in 1953. Actually, 1952 earnings weren't bad—but they could have been terrific. But now there's full production, healthy sales, no production curbs and no steel strike expected.

STEEL EXTRA INCREASES BECOMING GENERAL—P. 287
Though most steel producers declined to estimate the average of their extra price increases, it is believed the following increases may be generally adopted: Hot- and cold-rolled sheets, $1 to $2; hot-rolled bars nearly $5; rails, $6; track accessories, $3; cold-finished bars, shafting almost $10 a ton.

FEELINGS VARY ON SLIDING ZINC-LEAD DUTY—P. 290
It all depends on which side of the fence you're on. Many zinc mine producers favor pegging zinc at 15.5¢ per lb. But custom smelters disagree. And so do consumers. Diecaster W. J. Luring says his industry would cut zinc use 50 to 60 pct. Canadians would likely slap export tariff on nickel.

MATERIALS HANDLING

INDUSTRIAL MURDER—PLANT LAYOUT STUDY—P. 200
Best conceived plans for materials handling often fall victim to poor plant layout. Here's how to avoid costly blunders.

PERMANENT PALLETS FOR COST REDUCTIONS—P. 205
Shipping costs can be substantially reduced with permanent steel pallets. Maintenance is reduced to a minimum.

AUTOMATIC ASSEMBLY METHODS SAVE MONEY—P. 206
At 28 strokes a minute, this machine assembles small parts better, faster than by hand. Saves floor space, cuts costs.

CABINETS GROUPED FOR BETTER FINISHING—P. 208
Grouping mechanism on this conveyer line brings washer cabinets together for more uniform electro-spray painting.

WRAPPING MACHINE CUTS PACKING COSTS—P. 210
Hard-to-handle car bumpers are wrapped in a few seconds in this unusual machine. Machine accommodates design changes.

OUTPUT UP 400 PCT, HANDLING DOWN 50 PCT—P. 212
Mechanical handling of electric appliances parts rose tenfold in 5 years at this New England manufacturing plant.

PNEUMATIC TUBES SPEED PARTS DELIVERY—P. 217
Small parts are delivered to assembly points in only 5 min with this pneumatic tube delivery system.

IMPROVE QUALITY AND CUT MACHINE TIME—P. 218
Automatic handling of parts in machining operations reduces costs, improves quality and lessens operator fatigue.

BETTER METHODS COMMUTE FOUNDRY LABOR—P. 222
Modern methods in this 100-yr-old foundry have cut manhours 50 pct, pared floor space needs by 25 pct.

CONVEYERS CARRY COLD-EXTRUDED ROCKETS—P. 225
High output of cold-extruded rockets has been made possible by wide use of conveyer systems at Pontiac's new plant.

AUTOMATION: HANDLING SMALL PRESS PARTS—P. 232
Automated handling of small press parts has cut costs at this plant where most small presses have some handling equipment.

MACHINE ASSEMBLIES, INSPECTS SMALL PARTS—P. 236
Thousands of small parts are handled hourly in this special machine for building carburetor air-horn assemblies.

AJAXOMATIC* POURING UNIT

In Operation at Montrose Division, BENDIX AVIATION CORPORATION

Photo shows installation of AJAXOMATIC Combined Holding Furnace and Automatic Pouring Unit in connection with die casting machine. In circle at right is shown a closer view of the spout from which uniform shots of molten aluminum alloy are ejected at exact time intervals.

Now completely automatic die casting of aluminum alloys is possible in smaller quantities than formerly, and at reduced cost. This fact should be of special interest to the manufacturer who has die casting machines in operation and is doing hand ladling. The unit is entirely sealed, the operator feels no heat, accident hazard is eliminated.

This small, compact AJAXOMATIC* unit will increase production of die castings by as much as 25%, because it delivers regular, uniform quantities of metal into the die casting machine with no delay, immediately after dies are closed. The spout itself is heated and the temperature of each metal shot remains constant.

* Patents Pending

For further information send for descriptive folder A-4

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AJAX TAMA-WYATT

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THE IRON AGE

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Circulation Representatives: Thomas Scott, James Richardson.

One of the Publications Owned and Published by Chilton Co., Inc., Chestnut & 56th Sts., Philadelphia 39, Pa.

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Society of Business Magazine Editors

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National Business Publications

What About Steel Prices?

RAISE the price of bread 1¢ or 2¢ a pound and what happens? Nothing! Just small type in the papers. Raise cigarettes a cent a pack and is there a roar of protest? Not a murmur. Just a mere mention.

How about a raise in the price of sheets—bed sheets? Not too much talk. Certainly not enough to cause people to write to their congressmen.

When milk goes up 1¢ or 2¢ a quart it is blamed on a complex dairy formula with a lot of statistical gobbledegook. No family fights, no charges of gouging.

But let steel go up ¼ of a cent a pound ($5 a ton) and all hell breaks loose. Steelmakers are accused of gouging. Labor leaders act as though they were robbed. Congressmen appeal for "self-restraint." Politicos say "don't rock the boat."

People who wouldn't know a steel sheet from a linen sheet (or a cotton sheet) write letters to the papers demanding investigations and reprisals. All this gets headlines and editorials.

Why all this furor? Because the previous Administration made steel the national whipping boy. No-truth and half-truth propaganda against steel was so well handled that it almost made this basic industry public enemy No. 1.

Steel *is* basic. It is needed for our civilian life and for defense. Its financial condition must be sound. It must make a reasonable profit in real dollars—not inflated ones. It must be able to borrow for expansion, to pay its bills, to do research for better products, to enlarge markets and to replace obsolete equipment.

To do all this its products must be priced right—realistically, not subject to whims, fears of Washington retaliation or labor's pressure. Controls are off. It is natural for the whipping boy to want to take his rightful place in society at long last.

Let steel people uproot their New Deal-induced inferiority complex. If they know their prices are too low for financial safety and for assurance of a strong, bold and healthy industry let them raise them. But let's not have faint-hearted squeaks, vague statements about extras and future costs delivered in a painful defensive attitude.

The steel industry will outlive its past, present and future managers. It deserves more than apologies from its own people—especially under an Administration which claims to believe that the only reason for being in business is to show a profit.

Tom Campbell

Editor

Dear Editor:

Letters from readers

The Happy Gambler

Sir:

I have followed your editorials in THE IRON AGE for quite some time, and I would like to have you know that I get a bang out of them.

The one in the Apr. 23 issue, "The Happy Gambler," struck me particularly well and I am writing you asking for the privilege of our having about a thousand pieces reprinted so that we can include them in our mailing to our dealers, with proper credit, of course.

I ask that you kindly grant us this favor.

T. J. GETZEN

Getzen Co.
Elkhorn, Wis.

Nothing To Fear

Sir:

I enjoyed reading your editorial, "Nothing To Fear," in the Apr. 16 issue.

I believe it would be well if everyone could read this editorial, as sometimes we allow our emotions to run away with our good judgement.

J. SLOAN
Purchasing Agent
Youngstown Sheet & Tube Co.
Youngstown

Choosing Foremen

Sir:

May we have your kind permission to reprint "Foremen: How To Pick A Good One," which appeared in your Apr. 16 issue, in "Supervisor's Memos & Quotes," a new monthly publication for industrial supervisors and foremen.

M. FRIEDLANDER
Editor
Supervisor's Memos & Quotes
Mystic, Conn.

Production Fixture

Sir:

Would you please send us 12 reprints of the article, "Production Fixture Increases Drill Press Output," which appeared on p. 130 of your Apr. 16 issue.

W. K. SMITH
Skinner Electric Valve Div.
Skinner Chuck Co.
Norwalk, Conn.

Conserve Alloys

Sir:

This office is engaged in the preparation of manuscript material for the information of Ordnance materials and design engineers in the interest of the conservation of strategic and critical alloying elements.

Permission is requested to use the following described materials as an enclosure to this text, an article entitled "Alloys: Conserve Now — Be Safe In War," Apr. 9, 1953, p. 73 to 75.

It will be appreciated if you will let us know whether the above identified article with an appropriate credit line may be used.

R. W. WHITE
Assistant
Officer of the Chief of Ordnance
Army Dept.
Washington

New Tester

Sir:

In your Mar. 19 issue, p. 143, a new tester for sheet steel is described. It is called the Flex-Tester and is made by Steel City Testing Machines, Inc.

We would appreciate the address of this firm as we are interested in further particulars about the apparatus, price, etc.

P. GAST

Dansk Industri Syndikat
Compagnie Madsen, A/S
Copenhagen, Denmark

The address of Steel City Testing Machines, Inc., is 8817 Lyndon Ave., Detroit, Mich.—Ed.

Warehousing Plus

Sir:

We were very much interested in reading the article "Warehouse: Precision Piles Up Profits" in your Apr. 16 issue regarding Eastern Brass & Copper Co.

Would you please give us their full address so that we may get in touch with them?

G. A. JOHNSON

Columbia Fastener Co.
Chicago

The address of Eastern Brass & Copper Co. is 1126 E. 180th St., New York 60, N. Y.

Conversion

Sir:

Please send us three copies of the article "Special Burner Converts Gas Furnace For Oil" from your Apr. 13 issue, p. 89-92.

A. NICHOLLS
Librarian
Incandescent Heat Co. Ltd.
Birmingham, England

Induction Heating

Sir:

I am writing to request three copies of "Dual-Frequency Induction Heating Lowers Process Costs" appearing in the Apr. 16 issue.

J. M. EDWARDS
Section Manager
Electronics Div.
Westinghouse Electric Corp.
Baltimore

Fatigue Cracks

by William M. Coffey

Eastern Front

Happened to spend a few days in the beautiful Shenandoah Valley of Virginia a few weeks back—on business. The occasion was the annual "clear the air or throw the meat on the table" ramble undertaken by your ffj staff, the object being to seek the inspiration of apple blossoms and the bowling green (it snowed for 3 days) to map plans for making your ffj even more appealing to the whole family in the year ahead. Sessions lasted from 8:30 A.M. until the moon came over the yardarm, but once we did slip away to a newsstand and our eye caught a booklet entitled "Facts The Historian Leaves Out," or "A Youth's Confederate Primer." Thinking this would straighten us out on a few things we flipped a page to this, quote:

> *"The trouble was that what Lincoln was aiming at was the crippling of the Confederate war effort."*

We simply want to go on the books as saying that's as fair and impartial a statement of the facts as we've ever read about that conflict. Both sides should agree with this one. And before any Confederate friends take issue, let us hasten to recall the words of the great Stonewall Jackson — "Who touches a hair of yon gray head, dies like a dog. March on," he said.

* * *

. . . which brings to mind the joke that Mr. Mason originally told Mr. Dixon, who passed it down through other Dixons until it reached a Sgt. Horatio Dixon of the 23rd Louisiana Shoe Repair Battalion, who was taken prisoner at Second Bull Run. Sgt. Dixon took his joke north with him, where it spread like a brush fire, and that accounts for the fact that last week it panicked the boys in the men's locker room at the UN. Here it is, suh:

Western Front

Tom Rohan, our Regional West Coast Editor, caught this item from Herb Caen's column in the San Francisco *Examiner:*

> **Harvey Douglas Murray, a worker at Bethlehem Steel, decided it was time he bought a car—so he went over to Columbus Motors the other day and bought himself a sedan. He made a down payment, said he'd pay the rest on time, and sat down to fill out the necessary papers. When he came to the line reading "Income other than salary," he wrote: "$42,000,000 trust fund."**
>
> **The Columbus Motors people looked at each other strangely, but it's true enough. For Murray is heir to a Honolulu fortune, his income from the trust fund is $42,000 a year—and he's working as a cradleman at Bethlehem because "I like hard work." Oh, yes, about the car he bought. It's a '48 Chevvie. His cash down payment was $200.**

Points up the type of people we are proud to have in the industry.

Puzzlers

It started to snow at 9 a.m. (April 23rd puzzler) and winners so far are: J. R. Eliason, Bill Farley, 3rd, James M. Talbot, Z. B. Kopicki, Robert S. Geller, Jack Flint and John Lessen.

New Puzzler

Messrs. Bridgeport, Somerville, Paterson, Middletown and Reading all live, work and take their vacations in towns bearing those names. No two of them live, work or play in the same town and none has ever visited a town bearing his own name.

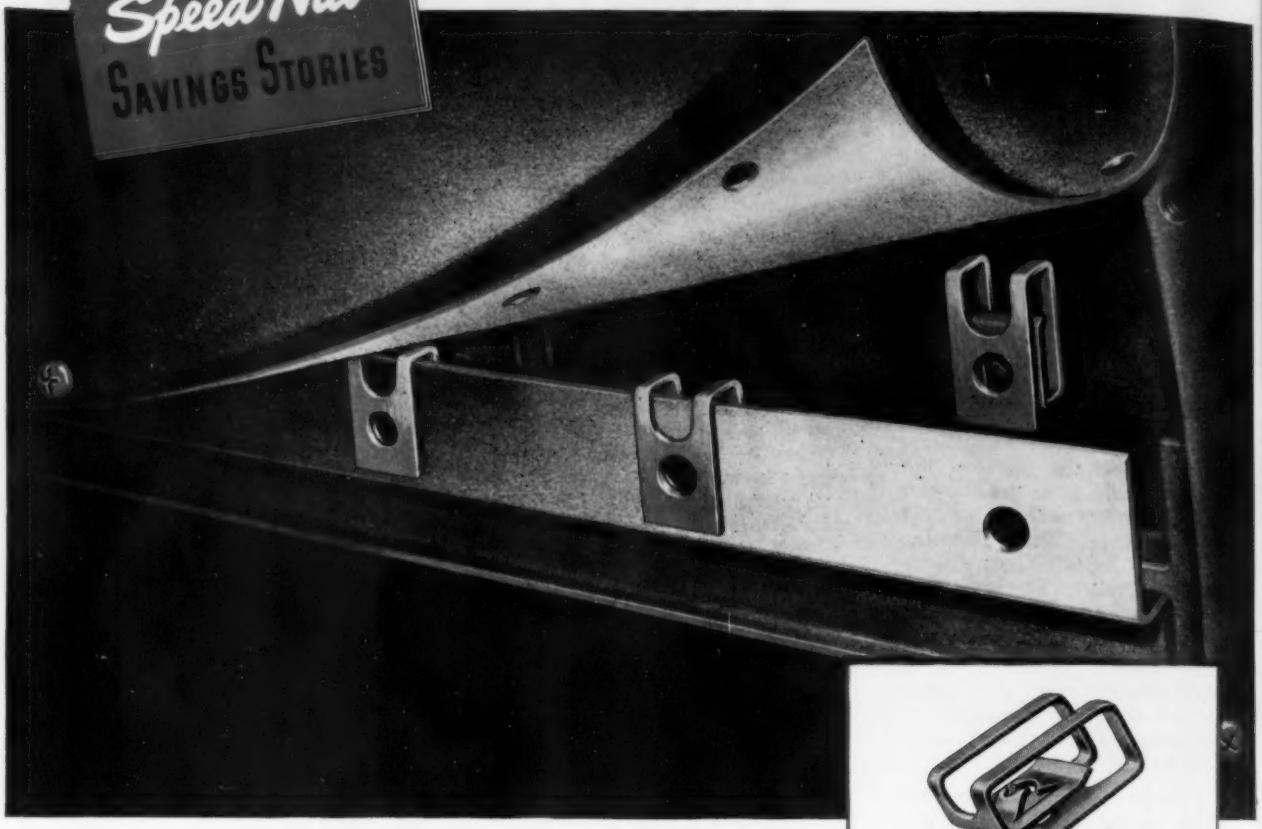
1. Mr. Bridgeport lives in Paterson and works in Somerville where Mr. Middletown spends his vacation.
2. Mr. Reading works in the town where Mr. Paterson spends his vacation.
3. The man who works in Middletown takes his vacation in Paterson.
4. Bridgeport is the home-town of the man who works where Mr. Middletown lives.

Whose place of business is at Bridgeport or where does each live, work and play? Many thanks to Mr. Heach, Tonbridge, Kent, England, for this one.

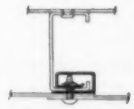
TINNERMAN

Speed Nut Savings Stories

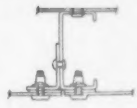
FASTEST THING IN FASTENINGS®



U-TYPE SPEED NUTS



SPEED NUT WAY: A U-Type SPEED NUT and a No. 10 sheet metal screw are all it takes per hole application.



OLD WAY: Required: 2 each, PlateNuts, Screws, Washers; 4 rivets; 1 angle trim; 1 doubler strip, per hole application.

Comparing the above methods it's easy to see how the 450 hole applications required per airplane amount to tremendous savings.

CONVAIR saves 448 man hours per plane...on one SPEED NUT fastening operation!

Tremendous savings like these by Consolidated Vultee Aircraft Corporation's San Diego Division may be hard to imagine, but...they can be made! Convair Engineering and Production experts are making this amazing economy on *one* SPEED NUT fastening operation...the installation of cargo liners in the new Convair 340 passenger transport! Also, the same operation yielded a sensational 80% reduction in production time, plus a 40% cut in materials and handling. Completing the story...the use of this U-Type SPEED NUT has eliminated an entire assembly section, releasing several trained aircraft workers to other production jobs!

Considered in terms of industry-wide aircraft production...savings and production boosts like these can mean millions of dollars. For similar solutions to fastening problems you may have, see the Tinnerman representative in your area!

Send today for your copy of SPEED NUT "Savings Stories": write: TINNERMAN PRO[illegible]

Dates to Remember

Meetings

May

NATIONAL WELDING SUPPLY ASSN.—Annual convention, May 11-13, Gibson Hotel, Cincinnati. Association headquarters are at 1900 Arch St., Philadelphia.

RAIL STEEL BAR ASSN.—Annual meeting, May 11-13, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 38 S. Dearborn St., Chicago.

AMERICAN MINING CONGRESS—Coal Convention and Exposition, May 11-14, Public Auditorium, Cleveland. Headquarters are at 1200 18th St., Washington.

EXPOSITIONS

MATERIALS HANDLING SHOW—May 18-22, Philadelphia.

NATIONAL METAL SHOW—Oct. 19-23, Cleveland.

THE NATIONAL ASSN. OF SHEET METAL DISTRIBUTORS—Spring meeting, May 14-15, Deshler-Wallick Hotel, Columbus, Ohio. Association headquarters are at 1900 Arch St., Philadelphia.

ASSN. OF IRON & STEEL ENGINEERS—Annual spring conference, May 18-19, Statler Hotel, Buffalo. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

METAL TREATING INSTITUTE—Annual spring meeting, May 18-20, Shamrock Hotel, Houston, Tex. Institute headquarters are at 271 North Ave., New Rochelle, N. Y.

INDUSTRIAL FURNACE MANUFACTURERS ASSN., INC.—Annual meeting, May 18-20, The Homestead, Hot Springs, Va. Association headquarters are at 412 Fifth St., N.W., Washington.

SOCIETY FOR EXPERIMENTAL STRESS ANALYSIS—Spring meeting, May 20-22, Hotel Schroeder, Milwaukee. Society headquarters are at Central Square Station, Cambridge.

GAS APPLIANCE MANUFACTURERS ASSN.—Annual meeting, May 20-22, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 60 E. 42nd St., New York.

AMERICAN STEEL WAREHOUSE ASSN., INC.—Annual meeting, May 24-26, The Shoreham, Washington. Association headquarters are at 442 Terminal Tower, Cleveland.

ALUMINUM WARES ASSN. — Annual meeting, May 24-27, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 1506 First National Bank Bldg., Pittsburgh.

COPPER & BRASS RESEARCH ASSN.—Annual meeting, May 24-27, The Homestead, Hot Springs, Va. Association headquarters are at 420 Lexington Ave., New York.

The NEW T-H Exide-Ironclad

★ 20% more capacity in the same space

★ Lowest cost per A.H. to own and operate

Heavier demands on all types of battery-powered haulage equipment dictate the need for batteries with greater capacity.

The new Exide-Ironclad T-H battery gives 20% more capacity in the same space—WITHOUT SACRIFICE OF LONG LIFE for which Exide-Ironclad Batteries are famous.

This new T-H battery is of the time-tested Exide-Ironclad construction, employing the exclusive slotted tube positive plate. New materials have made structural changes possible, which permit the use of larger positive plates—resulting in increased capacity.

The T-H line of Exide-Ironclad Batteries includes capacities for all battery-powered haulage units.

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1888—DEPENDABLE BATTERIES FOR 65 YEARS—19

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The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

INDUSTRY'S GROWING DEMAND for more and better means of moving parts and materials may push the fast-moving materials handling equipment industry past the $1¼ billion sales mark this year. Only 6 years ago sales were at the $500 million mark.

MANY MARGINAL PRODUCERS OF MACHINE TOOLS may be forced out of business if the government does not relax restrictions on depreciation, it is reported. Builders also believe faster tax write-offs are needed to keep the machine tool industry from becoming obsolescent.

SEVERAL STEELMILLS WILL HAVE CARRYOVERS from third to fourth quarter this year if cancellations do not come in. Several mills have reduced bookings in an effort to become current at the end of the third quarter. But equipment breakdowns and M-16 requirements earlier this year may offset these efforts.

EASING OF DEFENSE MACHINE TOOL REQUIREMENTS may have important repercussions in the auto industry. New V-8 engines will be introduced earlier than anticipated. All stops are pulled out for fast delivery.

NO LOVE IS LOST BETWEEN UNITED STEELWORKERS AND CIO chief Walter Reuther. But any rumors of USW secession can be discounted, at least for the immediate future.

SECONDARY EFFECT OF RECORD AUTOMOTIVE PRODUCTION is an unprecedented prosperity among automotive parts makers. First quarter reports indicate many are well on their way to the best years in their history.

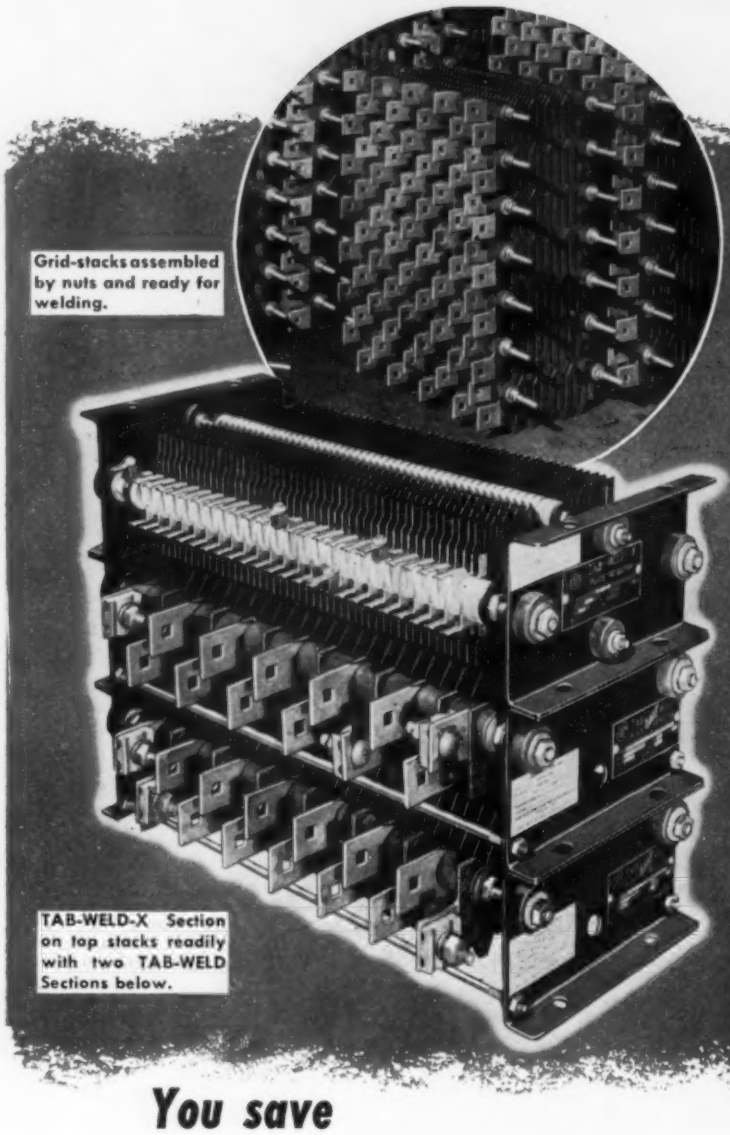
PRACTICALLY ALL ENTRAPPED HYDROGEN IS REMOVED by a new compound being used to degasify cast magnesium. Properties and soundness are improved and a much finer fracture grain size is obtained.

AN ALUMINUM-MAGNESIUM ALLOY is being used in England to fabricate a 50,000 cu ft transport tank for liquid oxygen. It is also believed to be the first such tank made in England by Aircomatic welding.

FUNDS TO BUILD PILOT MODEL OF A NEW TYPE TANKER are being sought by the U. S. Maritime Administration. Plans for the ship are through the blueprint stage. Primarily a commercial, point-to-point tanker, the ship would have speed and other military-type features for fast conversion to a fleet oiler.

A NEW METAL-CERAMIC COMBINATION has simplified soldering problems. The metallic areas, fired and integral with the ceramics, permit soft soldered joints to all other metals.

BRITISH EXPERIMENTS IN EXTRUDING POWDERED SAP aluminum billets show increases in mechanical properties of 10 to 20 pct. Wing sections made this way might be better than press-forged sections.



Grid-stacks assembled by nuts and ready for welding.

TAB-WELD-X Section on top stacks readily with two TAB-WELD Sections below.

clamped by nuts . . . then WELDED

Spot-welded to insure continuous current-path.

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EC&M TAB-WELD Plate Resistor Sections are assembled on rods to form the grid-stack like any other grid section. Clamping-nuts squeeze the grids into intimate contact internally before the end-frames are added.

Then, in these EC&M sections, the tab-ends of adjacent grids and tap-plates are *welded* to maintain intimate contact and to eliminate burning at the grid-eyes and at the tap-plates. This is an exclusive EC&M feature. Tests show that welding stabilizes the OHMIC value of the section, independent of clamping-nut pressure.

In addition, EC&M TAB-WELD Plate Resistors can be used without alteration, from the storeroom shelf. On-the-job connections are easily made to any of the tap-plates . . . small adjustments in resistance-value readily available by moving only the external-lead and terminal-block.

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EC&M BULLETIN

942

WELDED PLATE RESISTORS

THE ELECTRIC CONTROLLER & MFG. CO.

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NDUSTRY: The Less Handling, The Better

Materials handling provides greatest potential for reducing production costs . . . More importance will be given to management . . . Less emphasis on machines—By E. C. Kellogg.

Four men were clearing a pile of ubble that had accumulated dur- g a sidewalk repair job. One an bent down and picked up a mall slab of concrete from the top f the pile, handed it to a second an who tossed it to a third. The hird worker handed the slab to fourth man who hurled it on a ump truck. The truck driver sat nside the cab reading a newspaper.

This act of materials manhan- ling was committed in New York ast week. Fortunately industry as eliminated the bucket brigade echnique from most of its mate- ials handling operations.

Pushed By War

Spurred by new methods de- veloped for the Armed Forces dur- ing World War II, industry has improved its handling methods in the last 7 years. Value of handling equipment that will be produced this year is estimated at $1.2 bil- ion, more than double the 1947 otal of $500 million. Further ex- pansion is expected (see p. 163).

Despite its increased use of fork rucks, conveyor belts and overhead ranes, industry still needs an in- ensive workout to trim its bulg- ing materials handling costs. Pro- duction men agree that there is more room for cost cutting in this area than in any other manufac- turing operation.

It Costs a Lot

Though estimates of the cost of moving materials in various indus- tries range from 6 to 70 pct of overall product cost, 25 pct is the generally accepted average for all industry.

Two years ago a well-known materials handling engineer stated that industry spends more than $9 billion moving materials to plants, through plants and to sales outlets.

He estimated that if modern materials handling methods were used in all these operations, $2 billion would be saved, and 1 million more men would be available for production jobs.

Reduce Product Cost

Other materials handling authorities have estimated that 80 pct of the unskilled labor in plants is used to move materials, and that consumer products would cost 40 to 100 pct more if it were not for the advances made in handling techniques during the last 15 years.

Pace-setter in refining materials handling techniques has been the auto industry which has made the nearest approach to the automated factory. One industry spokesman recently stated that production savings of $50 to $100 per car had been realized because of materials handling improvements.

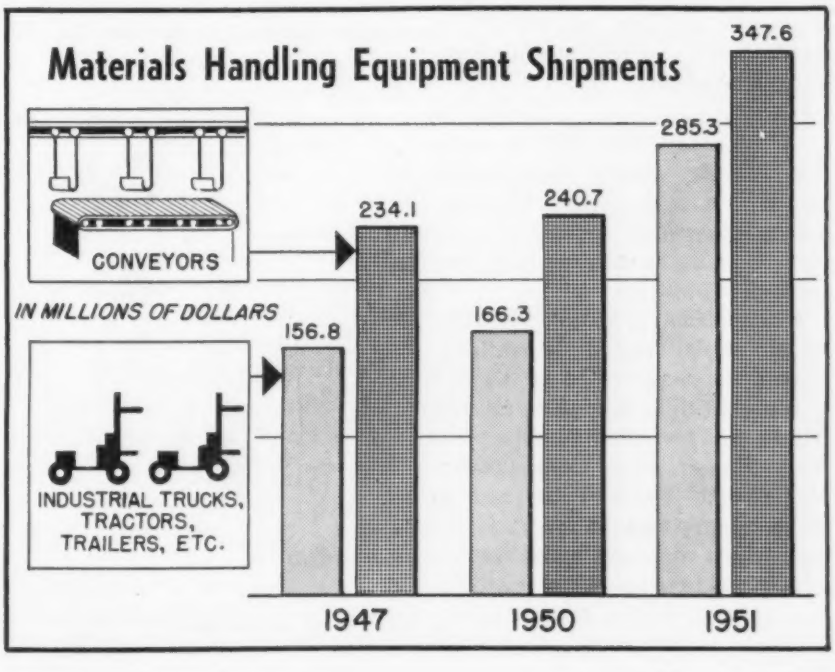
Develop New Units

Recent years have seen the introduction of two-way radios in fork trucks, development of a variety of truck attachments that will do almost everything except scratch your back, and use of conveyor belts with zippers which can be closed to form a conveying tube to protect food, pharmaceuticals and other items.

Other current innovations include fluid drives for overhead cranes, expendable and collapsible pallets, conveyors that can be ordered in standard lengths, and electronically controlled elevators.

Last year the materials handling manufacturers adopted a practice common in other industries by offering belt conveyors and fork trucks for use on a lease basis.

In the materials handling surge



How to Improve Your Materials Handling

1. Plan plant layout and materials handling system for new facilities simultaneously.
2. For a quick check on the efficiency of your handling system—follow one piece of equipment through your plant—from receiving point to shipping point.
3. Set up an accounting system that does not bury handling costs in other categories.
4. Keep passageways clear for materials handling equipment . . . Don't pile material on the floor . . . Use pallets or skid platforms.
5. Use automatic door openers with overhead pull ropes, switches, push buttons or electric eyes for faster truck handling.
6. Make certain machine operators do not have to move material . . . Set up a signal system so that machine operators can signal when they need handlers to bring or remove material.
7. Use signal system to direct fork trucks—two-way radios, phone, bell, loudspeaker or lights.
8. Avoid split level plant additions.

since the war, there have been inevitable disappointments. As one consulting engineer told THE IRON AGE, "A lot of plants were machine happy after the war. They thought all they needed were a couple of fork trucks and a stack of pallets and that would end their handling problems."

Finding that new handling devices were not the complete answer, management has been placing more emphasis on methods. This trend will continue and should result in better use of materials handling equipment.

Need Top Man

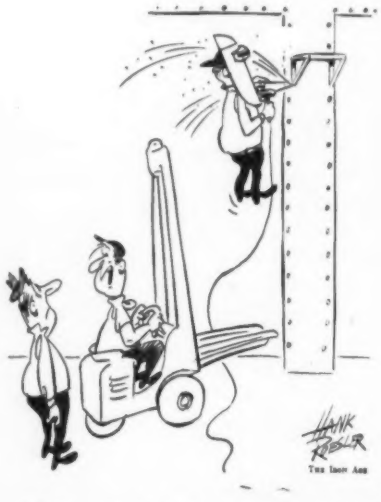
To develop better management methods, it is important that the person selected to supervise materials handling be on a top executive level.

By appointing a man to integrate its materials handling operations, one of the major soap companies is reported to be saving $1 million per year. This handling supervisor is in a position to tie-in product traffic with warehousing and to make suggestions on package design which will meet pallet loading requirements and fit in with the capacities of handling units.

When a new sales program is outlined, he is in on the planning stage and can make arrangements for an increased product flow.

Upped Production

As a result of a management materials handling study one metalworking plant increased production by moving its supplies out of the plant to a vacant lot about a mile away. New machinery was installed in the vacant storage space, and a 2-hr cushion was set up on materials shipments from the storage dump so that there was no delay in machining operations in the plant.



"Wait till he finds out I lowered the forks."

Another company has refined its shipment timing to the point that materials arriving at the plant's freight siding can be fed directly to machines without having to be stored.

Made Them Sick

One materials handling problem in a fruit processing plant had to be solved by an industrial psychologist. The company had been using a conveyor belt to move lemons through the plant, but found that for some reason men working near the conveyor suffered from attacks of nausea.

A psychologist was called in and after studying the plant decided that the visual impression of yellow lemons bobbing on the black conveyor belt made the workers seasick.

Use of a peach or tan-colored belt was suggested and the problem was solved.

Future trends in materials handling are difficult to pin down because the opinions of men who know the field often clash. About the only developments they agree on are that use of materials handling equipment will increase and that management will improve its handling techniques.

Accent Industrial Trucks

Some authorities believe the accent on use of industrial trucks will continue during the next 10 years, with proportionately less emphasis on other handling methods. Versatility of trucks is given as the main basis for the expected increase in usage.

But others in the industry think conveyors will become increasingly important as more industries strive for automation.

Probable result will be that an increase in the number of fork trucks being used will mean that more conveyors will be needed and that more conveyors will create additional demand for fork trucks of different types.

STEEL: Prices Up on Most Items

Most tonnage products will eventually show higher extras . . . Base prices may rise later . . . Firms reluctant to estimate increases . . . Buying patterns may change—*By J. B. Delaney.*

Steel price extra changes now being made will eventually embrace virtually all tonnage products of the industry.

Important thing to keep in mind is the industry's determination to put all products on a paying basis. General increases in base prices will come later, probably after settlement of steel labor negotiations. A few base price changes have already been made.

The extra revisions have been a long time coming. For some companies this phase of steel pricing has not been altered to any great extent in nearly 4 years; for others it's been almost 3 years. Had it not been for price controls they would have been made sooner.

Change Buying Pattern

Net effect of the changes will be an increase in costs for the steel consumer. But not all the revisions have been upward. Some extras remain the same; some have been lowered. By changing their buying pattern individual consumers will be able to keep their cost increases to a minimum.

Most producers are reluctant to estimate overall effect of the changes in terms of dollars and cents. They contend that to the individual consumer such an average is meaningless.

The few estimates that have been made are based on a study of orders now on the books for products affected. One producer took a month's orders and made its estimate on that basis.

Products for which average effect of the changes have been made include hot-rolled and cold-rolled sheets and hot-rolled strip, up $1 to $2; hot-rolled carbon steel bars, up slightly less than $5; cold-finished carbon bars and steel shafting, up slightly under $10; wire rods, up $2 to $4 depending on quality and analyses; nails, negligible increase; fence, no change to up $3; wire rope, no change; baling wire, up $6; wire fabric, up about 4 pct. It is probable that effect on products similar to those mentioned will be about the same.

Base price changes include a $6 per ton increase in rails and a $3 boost on track accessories by Colorado Fuel & Iron Corp., and Bethlehem Steel Corp.

The industry is showing some irritation over assumptions that its revision of prices will make it more amenable to demands of the United Steel Workers of America (CIO) for higher wages. Eugene Grace, chairman of Bethlehem Steel, put this one to rest when he said his company will oppose any increase in wages. But higher wages will mean higher prices.

Products already affected by extra changes include hot-rolled strip, hot-rolled and cold-rolled sheets, hot-rolled bars, cold-finished bars and shafting, enameling sheets, hot and cold-rolled silicon sheets, wire and wire products, concrete reinforcing bars, carbon tube rounds, carbon rods, alloy bars, alloy semi-finished, galvanized sheets, and long ternes.

Cold-rolled sheets provide a good example of what the steel companies have done to bring their extra charges back into line. For instance, size extras on 19 gage stock range from no change to $2 per ton higher. On some of the lighter gages and widths the changes range from an increase of $1 to a reduction of $11 per ton.

Increases in alloy bars and alloy semi-finished ranged up to $30 per ton in grade extras. The $30 increases are in grades calling for high nickel content and reflect higher nickel costs. Size extras in carbon tube rounds are up $5 to $6; size extras in carbon bars rose from $1 to $11.

Examples of Steel Extra Revisions

Alloy bars and alloy semi-finished (per ton) . . . Grade extras—Bars, up $2 to $30; semi-finished, up $2 to $30; Size extras—bars, up $2.50; semi-finished, no change to $5. Semi-finished cutting extras are up $3 to $10, treatment charges, up $4 to $6; grinding extras, up $10.

HR carbon tube rounds . . . Size extras, up $5 to $6; quantity extras up $5 to $10 on orders ranging from 1 ton to 3 tons; extras for "additional restrictive requirements" are off $3.

HR carbon bars . . . Size extras, up $1 to $11; quantity extras, from no change to $10; specifications and tolerance, up $2; processing, up $6 to $8; pickling, up $3 to $7; minimum blocking extra, up $10 per car; box car loading extra, up $1.

Concrete reinforcing bars . . . Size extras, up $4.

Wire rods . . . Average increases—chain quality, $2; coat hanger quality, $2; cold heading low C, $4; cold heading high C, $2; welding rod, $2; size extras average approximately $1 increase; heat treating, annealing and normalizing extras, average $4 increase; chemistry extras, $1 average up and down.

Nails . . . Average increase practically zero.

Fencing . . . No change to up $3 per ton.

Wire rope . . . No change.

Wire fabric . . . Average increase about 4 pct.

Baling wire . . . Average increase $6 per ton.

Cold-rolled sheets . . . Gage and width extras, range from $11 off to $4 up; length extras, from $2 off to $2 up; circles, from $1 to $2 up; quality extras, from $1 off to $1 up; specification extras, unchanged with exception of one silicon specification, which is up $1; packaging extras, largely unchanged.

COLOR: Paint Plants Scientifically

When manufacturer brought daylight lighting into shop he got wrong results...Had considered only lighting, not lighting in harmony with color...How to paint—By T. Metaxas.

Like many other progressive manufacturers who want to gain more productivity by improving seeing conditions, Mr. X brought daylight into his plant to replace the dusk. To make his plant a brighter, cheerier place while permitting his machinists to see their jobs more accurately, he installed a battery of fluorescent lighting fixtures whose price he could not resist at a plant auction.

But instead of fulfilling his best intentions, the daylight achieved just the opposite effects. His production chart moved quickly enough —but downward. Morale certainly did not improve, for his workers could be seen walking around with squinted eyes.

In one major respect, Mr. X was right. More lighting was desirable, especially for his fine-sight machine work. But light for the sake of light, ignoring a most important aspect of brightness engineering, was only half the answer. Mr. X found out that if he wanted his men to work in daylight he would have to consider the colors of his walls, his floors, machines, and equipment.

Mutterings of Eyestrain

Mr. X had paid some attention to color—the wrong kind. While he was installing the fluorescent fixtures he had his dark walls repainted a gay yellow to spread his artificial daylight.

Mutterings of "eyestrain" reached him and being an old hand at the lathe he took a turn at it to find out the "why" of all these negative results. Lighting was indeed bright, he noticed. Perhaps too bright against the light colored walls which seemed to jolt his eye pupils into shuttering to adjust to the outright glare. When his eyes turned to dark machinery and to the working point there was another pupillary adjustment. And somehow bright areas exerted a compelling attraction to the eyes.

With his eyes still smarting he called in color specialist Faber Birren, of Faber Birren & Co., New York City. And so Mr. X learned that lighting conditions before he had installed daylight although not adequate had been better than they were now.

It was true the shop had been dimly lighted but individual lamps directed toward the working point had alleviated sight difficulty. The working point had properly been somewhat lighter than the surrounding area. What he had done by bringing in high-power fluorescence and painting walls light was to create many fearsome light and dark contrasts which bewildered the eye and drew worker attention not to the darker job area but to the walls.

Mr. X's walls had a light reflectance of 75 pct. This fought with dark machinery and floors which reflected 2 to 5 pct of the light. If Mr. X had wired in still more light, the seeing conditions would have become even more intolerable.

Mr. Birren told the manufacturer he could either rip out his new lamps or do something about his color combinations. He would have to paint a certain uniformity of colored brightness into his shop —not monotony, of course. To handle such an intensity of light, colors must be toned up and toned down toward a range of from 40 to 60 pct light reflectance.

Subdue Glare Spots

The yellow walls must be subdued to reduce contrast, especially since the shop was small and wall glare was concentrated. For visual work and to lead attention to the job point, walls should be green, a light green paint for upper walls, and a medium green for dado (lower wall) and trim.

After wall brightness has been subdued, colors of floors, machinery, and equipment must be built up towards the 40 to 60 pct reflectance range. Instead of relatively non-reflective black, floors should be a durable gray and machines an easy-to-retouch deep gray-green.

Actual working areas of machines should be painted a light buff color for better visibility at the job point. Since ceilings are out of the field of vision they should be white or an off-white to distribute light evenly.

From that point Mr. X discovered that judicious use of color and lighting could increase production, improve quality of workmanship and morale, reduce accidents, and simplify maintenance.

Serious color engineering started about 20 years ago in hospitals. Mr. Birren cites the instance of a surgeon who was almost blinded when working under 2000 foot-candles. White towels around the incision literally hurled light back into his

Color Engineering in Action

A test by Washington's Public Buildings Administration showed the benefits of combined lighting and color engineering. In the original condition of the room, lighting measured 10.5 foot-candles. Darkest to lightest ratio was extremely unfavorable.

With a new lighting system delivering 30 foot-candles and no color changes made, the ratio was reduced to a lower but still unsatisfactory 40 to 1.

Under direction of Faber Birren & Co., room and equipment colors were toned down or brought up to a favorable dark and bright ratio of 4.7 to 1. With these new working conditions, production rose 5.5 pct and PBA estimated gross payroll saving per employee at $139 per year. Mull over that figure if you have a large staff.

Scientific Color Painting Can:

1. **Increase Productivity**
2. **Lower Accident Rate**
3. **Promote Efficiency**
4. **Improve Maintenance**

eyes. When the towels were tinted gray-green the glare was comfortably minimized. Now makers of facing tiles produce a standard ocular green tile suitable for hospitals and industrial locations.

Today's progress in lighting can bring daylight into any plant. Mr. Birren's policy is to take advantage of light by smoothing out harsh color contrasts that form dark spots and glare spots. These are not only distracting but result in eyestrain and mental fatigue.

In adjusting plant shades to a narrow range of color uniformity, Mr. Birren tries to get the reflectance value of the brightest spot in the shop and reflectance of the darkest spot down toward a 5 to 1 ratio. With white walls reflecting 85 pct of light and black floors reflecting 2 pct, this ratio would be a distressing 42 to 1. If a plant had gray walls, reflecting 50 pct of light as the brighest point, and darker gray floors, reflecting 10 pct, the ratio would be exactly 5 to 1—ideal.

Does Daylight Pay?

Fortunately, the eye has a trait of color constancy which enables it to see with relatively equal facility under widely divergent conditions of lighting. Where seeing is not a critical feature of a job, mild lighting has been said by researchers to be best for comfort.

Most visual tasks can be done with fairly equal results under varying lighting, British research has shown. To reach 90 pct of seeing efficiency relatively few foot-candles of light are needed—but to attain 95 pct efficiency perhaps requires ten or more times the intensity of light. For some manufacturers it may not pay to invest in daylight except as a morale builder.

One of the most extensive uses of color engineering can be found in the Navy which adopted color principles advanced by Faber Birren & Co.

Navy Painting Principle No. 1 using soft tones of bluish green to cut down contrasts and make full use of available light is for normal shop conditions with a concentration of personnel. Navy ceilings are white. Upper walls are light green and dado (lower wall) and trim comprising about 35 pct of wall area are a deep green.

Color schemes extend to machinery. For Principle 1, machines are painted a medium gray with working parts highlighted in buff. So that huge machines do not dominate the shop, a darker gray paint is used.

Where greater seeing efficiency is needed the Navy has Principle 2, which simply uses a medium rather than deep green for dado and trim while machinery gets a lighter gray coat. In all cases equipment and lockers are painted the dado color. In cooler climates the Navy uses lighter, sunnier colors on walls.

Recommending color engineering steps for R. R. Donnelley & Co., printers, Faber Birren used such neutral colors as blue-greens for plant areas generally. Lighter greens for upper walls have a reflectance value of 50 pct, considered ideal for seeing. Dado and trim is a deeper green, but light enough to assure good housekeeping.

Skins and Surroundings

Mr. Birren told THE IRON AGE that blue-greens directly complement the human complexion, having approximately the same reflectance value. Too violent contrast between skins and surroundings tends to blur faces.

When Donnelley departments were considered dimly lit, Faber Birren suggested a combination of more highly reflective yellow and gray for walls. For good color discrimination, Birren recommended neutral grays which won't distort light while reducing glare.

In areas where critical seeing tasks were not performed, walls were painted white and gray. White walls were permissible in large plant areas where they were too distant to be a glare factor.

Mr. Birren explains that while he is trying for brightness uniformity he is simultaneously trying to avoid monotony. He has been known to order a faraway wall painted a sunlight yellow.

Painting operating machinery not only raises reflectance values but encourages maintenance, discourages slovenly habits. The machine green and varying grays Mr. Birren uses are calculated for good and easy maintenance. Where excessive grime may not be present and good machine maintenace is desired, Faber Birren may paint machines a lighter gray than for dirtier conditions where machine coddling is not so much a factor.

Move Machines About

Standardizing colors of operating machines permits them to be moved about without requiring a new coat of paint to fit new surroundings. To inspire cleaner worker habits, Faber Birren ordered wheels and controls of one plant's machines to be painted a light buff. Telltale marks soon showed how clean hands were.

Popularity of the Birren safety color code system is spreading through industry. Issued by du Pont in 1944 and substantially accepted by American Standards Assn., the color code uses High Visibility Yellow for such subjects as railings, obstructions which can be struck against or fallen against. Alert Orange goes on machine parts or wiring that are a constant hazard and black and yellow stripes are painted on car bumpers, beams and dead ends.

Fire Protection Red coats fire

—Management—

equipment and floor areas around it while Safety Green goes on first aid stations, equipment. Precaution Blue is painted on electrical control boxes.

Mr. Birren recommends the use of aluminum paint for equipment and piping which must stand up to heat.

Color engineering can provide significant savings in the safety field. After using the Birren color code, the U. S. Army Service Forces reported a reduction of accident frequencies in some of its plants from a rate of 46.14 to 5.58.

New York Transit System wrote Birren that his color code had helped reduce the rate of disabling injuries 76 pct.

Crediting Birren & Co. with a good deal of the glory, the Navy reported a 28 pct drop in its industrial accident frequency rate over a 3-year period.

Psychology of Color

There is also such a thing as color psychology. Rich colors may have low reflectance values but may be unsuitable because of contrary emotional connotations. Man is stimulated by brightness and warmth in colors. His mood and tempo of action are quickened. Even his blood pressure and pulse rate may rise. Thus for heavy physical tasks or for dreary climates warm colors may be used.

But for fine machine tool work or other visual or mental tasks these same warm colors may be needlessly exciting—hence distracting. Subdued, neutral colors to bend attention inward are needed.

Rest rooms, recreation and dining rooms look best in warm, sunny colors such as peach, coral, yellow. Windowless corridors need light colors.

There is coming a day when more specific statistics will be available on how much light is needed for a given job and what colors.

The lighting-color engineer may prescribe so many foot-candles of light for a certain job and balance this with so much reflectance for walls, so much for machines and equipment—in precise dosages.

STAMPERS: Order Pattern Shifting

Metal stampers, backlogs are high—but fourth quarter has some worried . . . Military buying dips . . . Civilian market is strong but auto sales are key to future—By *R. M. Lorz.*

Metal stampers resting on comfortable backlogs are beginning to wonder what their order books will look like when fourth quarter rolls around.

Right now jobbers are happy with an order volume 20 pct higher than last year's. And, according to estimates by the Pressed Metals Institute, automotive orders were up 50 pct for first quarter 1953 over the same period last year. Demand from other civilian producers was also up 30 pct over first quarter figures for 1952.

Some Feel Easing

Cautious thinkers in the industry believe the general level of prosperity will be maintained throughout 1953 although softening in certain segments of industry is already being felt.

While automotive production is still brisk, many stampers aren't overlooking the fact that Detroit may cut its buying schedules if spring buying isn't up to expected levels. Since Detroit auto plants eat up about 45 to 50 pct of all stampings turned out by both captive and job shops, a turndown here would be a powerful factor.

Stampers will probably continue to roll along with backlogs averaging 15 weeks if the automotive trade can sell the units it makes.

Military Sales Slip

Increasing evidence of more orderly retooling effort in Washington has already resulted in an estimated 10 pct drop in military sales. Defense business generally is still good but job shops are reporting fewer military inquiries. That means fewer orders over the long haul and lighter backlogs. Current backlogs ranging from 16 to 29 weeks in job shops will definitely stretch well into the third quarter.

Demand from major appliance makers is also causing some concern at the moment. During the first quarter stampings for refrigerators, stoves and driers moved at a torrid pace. Today appliance people are cutting production and taking a second look at inventories. They hope traditional fourth quarter Christmas buying will reverse that trend.

Stampers who argue against any serious recession look to the civilian market. Jobbers do more than 50 pct of their business in this area and it promises to be good for the rest of the year. Brisk demand is spread over a wide area ranging from electronic parts to stampings for tricycles.

TV CAMERA, monitor, receiver on 80-in. hot strip mill at U. S. Steel's Gary Sheet & Tin Mill, Gary, Ind., shows the progress of steel strip to operator. Comera scans an average city block—or 395 ft.

Profit margins in the industry have been getting narrower every year. Labor costs are comparable to those in the basic steel industry and stampers will be watching seventh round negotiations closely.

To combat an expected rise in labor costs, over 2000 small operators are improving customer service by increasing the numbers of secondary operations they perform. Most job shops today are drilling, tapping, spot welding and painting many stampings to give the customer a more complete job. Production planning is also replacing the shop order system as the flow of materials is speeded up.

Stampers Need Steel

The job stamping industry should go over the $500 million sales mark in 1953. If that goal is to be reached, stampers will need sheet steel. There has been some easing of the sheet supply in the past few weeks but stampers still cry for more. One Cleveland operator told THE IRON AGE he would snap up 100 tons of sheets immediately if they were available. As long as automotive production is maintained at current levels tightness in sheets is a foregone conclusion.

Despite worries about sheet supply and tapering appliance and defense orders, most stampers are confident. Wallace Ardussi, president of the Pressed Metals Institute summarizes the industry's hopes this way: "Our outlook is good but as far as new business is concerned it is becoming more competitive all the time."

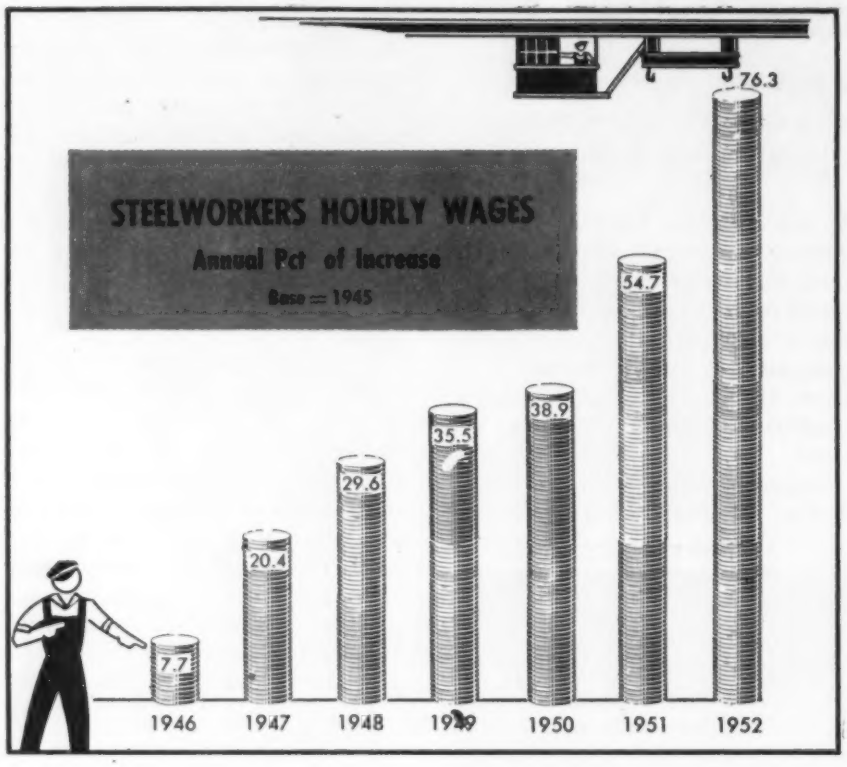
Amend Nickel Stainless Order

National Production Authority last week issued Dir. 1 to DMS Reg. 1 which in effect simplifies procedures for obtaining nickel-bearing stainless for making "B" products.

Under the direction, manufacturers of "B" products needed for rated orders may self-certify orders for sufficient nickel-bearing stainless to meet them. For unrated orders, the manufacturer is permitted to self-certify orders for amounts up to the quantity allowed during the second quarter.

Beginning with fourth quarter, no priorities assistance will be given in obtaining nickel-bearing stainless for purely civilian uses.

Allotment authority then will be limited to military and atomic energy programs.



STEELWORKERS: Planning Far Ahead

They'll fight hard for wage increase this year . . . But they're in no mood for strike . . . Policy statement spells out long term aims for annual wage, broad social gains—By J. B. Delaney.

If you listen closely, you can hear the United Steel Workers of America (CIO) whispering to the steel industry: 'Wait 'til next year."

At their meeting in Atlantic City last week, union leaders drew up demands for higher wages in negotiations that will get under way soon. But they gave the impression their minds were elsewhere.

In No Mood to Strike

Not that they won't fight hard to wrest a pay increase from basic steel producers. They have every intention of getting as much as they can, although they probably will snap up any "reasonable" offer from the industry. They are in no mood to strike.

The tip-off that 1954 is the big target for the Steelworkers is the statement of policy for 1953 adopted by the Union's International Wage Policy Committee.

First section of the statement is devoted to the demand for a general wage increase and elimination of the five-cents-an-hr North-South wage differential.

But the next two sections discuss the guaranteed annual wage and insurance and pensions. They call on the industry to join with the Union in studies "pertinent to the establishment of guaranteed annual wage plans" and "revision and enlargement" of existing insurance and pension programs.

In a speech several weeks ago, David J. McDonald, Union president, warned the steel industry that in 1954, when basic steel contracts expire in entirety, he will seek broad improvements in the pension and insurance programs, including diagnostic and preventive medical care, payment of medical, dental, drug, and appliance bills, and payment of all hospital bills. The guaranteed wage also can be taken up next year.

Mr. McDonald seems hard-pressed to find a good strong issue upon which to base his demand for a wage increase—the sixth since the war. He speaks of the steel industry as being "very profitable" and of the desire of the workers to share in the benefits of increased productivity. He also mentions the workers' "natural" aspiration to a better standard of living.

Complaints Muffled

But the union leader indicated indirectly that the steelworkers may not be so bad off at the moment. Apparently policy committee members did not complain seriously about economics. McDonald mentioned one member who wanted to be in position to afford "butter instead of margarine." Other delegates were described as anxious to pay off their automobiles and refrigerators.

The steel industry is prepared to give the Union a stiff argument on profits. Earnings in the last 2 years have been poor—so poor that industry leaders are concerned over their prospects of attracting investment capital for further expansion. High taxes also are siphoning off industry income.

Price Rises to Help Profits

Earnings in first quarter of this year generally are up. Higher prices also are expected to improve the industry's financial outlook this year. But steel executives will argue: (1) That the ingot rate won't stay at capacity indefinitely, and (2) that it's time stockholders got a bigger slice of the income pie to induce investment.

On increased productivity, the industry argues that the worker gets his share through incentive plans. Mr. McDonald says incentives are only part of the answer, that thousands of steelworkers are not covered by these incentive programs.

He did not indicate how much of a wage increase the Union has in mind. Scuttlebut has it he

would like to get 15¢ an hr. A lot of people are willing to bet the final figure will be in the neighborhood of a dime.

The odds favor a peaceful settlement of the Union's demands. Neither union nor industry leaders are giving serious thought to possibility of a strike.

Union Outlines Policy

Section I of the wage policy statement cited the "economic needs" of the workers, "their increasing productivity, the prosperous state of the industry, and the economic situation of the country as a whole" as justification for a wage increase.

Section II recalls that the guaranteed annual wage has been and is a "basic and fundamental objective of the Union" and recommends that the industry "promptly" undertake with the Union "a complete and exhaustive study" of the subject "so that the parties will be fully prepared to enter into constructive and informed negotiations to establish such plans when and where contractually appropriate."

Section III reminded that the present insurance and pension provisions were negotiated in 1949 and need to be enlarged and improved.

Area of Improvement?

A fourth section is aimed at companies outside basic steel whose contracts expire this year or where issues in addition to wages may be discussed.

The Union will seek to improve these agreements.

One demand mentioned in this section likely will be included among those presented to basic steel next year. It calls for "preferential hiring when plants or departments are discontinued." It is aimed to cover situations similar to the recent shutdown of No. 3 openhearth shop at U. S. Steel Corp's. Homestead plant which affected over 900 workers. For those workers who want to transfer, the Union would like them to have preferred treatment at other company plants.

ZINC: Industry Warned on Split

Dewey Short tells zinc meeting how to push desired legislation in Washington . . . Warns present division on tariffs, prices may not lead to proper decisions on bills.

How a businessman can put his shoulder behind legislation pending in Congress was told to members of the American Zinc Institute by Congressman Dewey Short, R., Mo., at the group's 35th annual meeting in St. Louis last week.

But Congressman Short tossed in a warning with his practical advice. He told zinc men if they could not agree among themselves on what legislation would benefit their industry it was unlikely Congress could arrive at the proper decisions.

Industry Is Split

He reviewed current bills which are supposed to protect the U. S. zinc mining industry. All are opposed by some and approved by other zinc people. In general, the bills call for either premium prices or sliding scale tariffs which would increase as the price decreases.

Some members of the zinc producing and consuming industries feel that zinc would be pricing itself out of the market under some of the plans. And there is a threat of reprisal legislation in countries which ship zinc to the U. S.

HIGH TEMPERATURE jet engine ceramic coatings are now used on combustion chambers of crop driers made by Hartzell Propeller Fan Co., Piqua, Ohio.

Mr. Short gave a down-to-earth timetable on do's and don'ts to push desired legislation:

1. Make yourself known in Congress until you get what you want.
2. Don't be impatient and shortsighted. Plan for good times during bad times.
3. Introduction of the bill isn't the end. Don't wait for Congress to carry on from there.
4. Wash dirty linen in private. Plan and organize, and educate congressmen.
5. Don't be downhearted if it takes 2, 5, 10 or 20 years to get favorable legislation—take a leaf from oleomargarine makers' book.
6. Consider the consumer in your ideas of correct legislation.

Predicts Good Business

In his address, IRON AGE Editor Tom Campbell outlined the strength of the economy and metalworking industry. He said we could not operate at a peak level forever. "But the corrective influences to come do not mean we must have a collapse, or even a serious recession."

Metalworking won't slump this year, Mr. Campbell said, but its future depends on: (1) New, better products, (2) elimination of obsolete equipment, (3) a hard-hitting sales staff, (4) an end to the negative attitude of waiting for the lightning to strike, and (5) a strong country.

B. P. Finkbone, Armco Steel Corp., said the zinc industry and the zinc-coated steel industry have failed to capitalize on the advantages of their product. He softened this by saying that defense, raw material shortages, price restrictions and high taxes made adequate expansion impossible.

Newly elected president is Marshall L. Havey, New Jersey Zinc.

NEW ENGLAND: Yes

Survey of businessmen shows regional support for present reciprocal tariff law.

The schism among industrialists on the need for low tariffs, no tariffs, and high tariffs resolves itself into the question of whether the manufacturer believes he will fare best under a free world market or a protected domestic market. (THE IRON AGE, Nov. 27, '52, p. 37.)

There are of course those manufacturers who will fare equally well under either system and base their attitude for or against on personal conviction.

Support Tariff Law

From the New England Council, Boston, come results of a multi-question survey which among other Congressional issues indicates strong regional support for an extension of reciprocal trade agreements. The present law gives the President authority to exchange lower tariff privileges with foreign countries—and gives him the right to overrule the Tariff Commission on "escape clause" decisions.

In a six-state survey of a wide variety of industries, the vote in favor of extending the present reciprocal trade law was 713 and against it, only 162. Those who had no opinion numbered 188. The New England Council thought these results highly significant because "so many of the region's products are sensitive to the tariff situation."

Free Trade Distant

Several manufacturers amended their "yes" vote on reciprocal trade extension by saying they did not believe complete free trade was yet practical. But there were indications many were willing to work toward that distant goal.

President Eisenhower has asked a simple 1-year extension of the tariff act, pending further study by a committee. Various congressional amendments to the act have

ote For Tariff Act

been suggested, some of which de-lete Presidential powers and other tariff-fixing authorities.

Put Skids on RFC

Briefly, the New England businessmen voted in favor of ending the Reconstruction Finance Corp., in favor of state ownership of tidelands, repeal of the Fulbright amendment of the Walsh-Healey Act, amendment of the Taft-Hartley Act, construction of the St. Lawrence Seaway, construction of military air bases in New England,

Survey Results

How New England Business Leaders Think on Major Congressional Issues

Businessmen were asked if they favored:

	Yes	No	No Vote
1. Extension of Excess Profits Tax?	124	917	22
2. Immediate general tax cuts before balanced budget?	229	813	21
3. Extension of present Reciprocal Trade Agreements Act?	713	162	188
4. Ending R.F.C.?	850	159	54
5. State ownership of tidelands?	711	248	104
6. Broader social security benefits?	423	556	84
7. Repeal of Fulbright Amendment to Walsh Healey Act?	275	158	630
8. Amendment of Taft Hartley Act?	604	335	104
9. Construction of St. Lawrence Seaway?	495	417	151
10. Construction of U. S. air bases in New England?	650	201	212
11. That Congress ask the President to use all possible means to end the Korean War including:	397	196	162
(a) atomic weapons	116	105	87
(b) total blockade of China	243	32	33
(c) invasion of Manchuria	112	106	90

and that Washington use all means to end Korean fighting even if it involved the use of total blockade, a Manchurian invasion, and use of atomic weapons.

A large number of those favoring repeal of the Taft-Hartley Act indicated they voted thusly only if there was a logical reason to do so or if it meant strengthening the act.

On RFC, one New Englander favored abolition of the agency only if another lending institution arose in its place to finance small business ventures. Another said the RFC was "totally useless and had left a bad taste in everyone's mouth."

STEEL: Earnings Outlook Brightens

First quarter earnings up 22.8 pct over 1952 . . . Price increases, tax relief may boost profit potential . . . Rapid amortization lowers Federal tax take—*By W. V. Packard.*

The earnings outlook for the steel industry has taken a sharp turn for the better. Here are the main factors making it seem a cinch bet that the industry's earnings record this year will be far superior to 1952:

(1) Industry earnings during the first quarter of this year are about 22.8 pct higher than they were during the similar period of 1952.

(2) Prospect of tax relief later this year (especially excess profits tax) may place the gain in earnings even higher.

(3) Current increases in extra charges (for special processing to meet consumer specifications) and base prices raises the profit potential.

(4) Steel companies will maintain their higher earning potential by again raising prices if higher costs result from seventh round wage bargaining.

(5) Consumer demand seems to assure high operating rates throughout 1953.

(6) Question of the seventh wage round is expected to be settled without a strike. It will be recalled that the worst strike in the history of the steel industry adversely affected steel earnings during 1952 (See p. 146.)

Margins Are Skimpy

While overall dollar earnings by industry or company look impressive, steel officials warn that profit margins are dangerously thin. The warning is that any sharp decline from record business levels might change the profit outlook drastically and suddenly.

The 22.8 pct gain in first quarter earnings over the same period last year is based on an IRON AGE compilation of earnings of 28 companies representing about 86 pct of the industry's ingot capacity (see accompanying table). Kaiser Steel Corp. and Keystone Steel & Wire Co. are not included in industry totals because their current reports cover 9 months' operations.

Steel Nets $29.2 Million More

The 28 companies earned $157 million in first quarter 1953, compared to $127.8 million in first quarter 1952, a gain of $29.2 million.

If the present excess profits tax law is allowed to expire at midyear (as expected) these financial results will appear even more favorable. Most steel companies charged the maximum 30 pct for excess profits taxes. If this law is allowed to expire, these charges may later be cut in half.

During the first quarter the industry produced 28,981,137 net tons of ingots and steel for castings, slightly more than the previous record established during fourth quarter of 1952. Operations were at 100.0 pct of rated capacity, compared to 106.0 during fourth quarter of last year, and 100.7 during first quarter of 1952. Capacity in 1953 is rated 8,934,800 tons over 1952 levels.

Write Offs Help

Another favorable factor not emphasized by company balance sheets is 5-year amortization of steel facilities expanded to support the defense effort. Had it not been for the so-called "fast tax write off" the accelerated amortization would have shown up as additional taxable profit.

In the case of U. S. Steel, first quarter 1953 profits were $5.9 million higher than during the similar period of 1952, while "wear and exhaustion of facilities rose $13.3 million. The corporation's estimated Federal taxes declined $10 million in the first period.

Booked Well Ahead

Steel business is still booming. Order backlogs of major producers are unchanged at about 4 to 5 months. This is as far ahead as they care to book on most products. Actually, order books are generally filled through the third quarter on products that have been opened for business.

Producers admit balance in wire and wire products, fence, nails, small-sized bars and galvanized sheets. But they express no alarm, viewing this instead as healthy.

Steel officials attributed current price increases to past cost increases that have not been previously compensated. They feel that steelworkers are not entitled to a wage increase on the basis of cost of living or settlements in other industries. But they seem determined that any increase in wages be reflected in higher prices.

Steel shipments for direct defense use have been averaging about 9 to 12 pct of all tonnage shipped. Marked increase is noted in shell steel requirements.

Steel Company Earnings

Company	First Quarter 1953	First Quarter 1952
U. S. Steel	$49,375,958	$43,534,212
Bethlehem Steel	30,961,033	18,926,045
Republic Steel	13,779,049	11,759,513
Jones & Laughlin	5,642,000	4,711,000
National Steel	11,084,933	8,772,466
Youngstown Sheet & Tube	6,958,975	7,038,787
Armco Steel	7,767,045	8,014,633
Inland Steel	6,805,150	6,936,470
Colorado Fuel & Iron	2,177,372	1,381,202
Wheeling Steel	3,251,383	2,782,208
Sharon Steel	2,051,826	1,370,802
Kaiser Steel	*5,592,091	*7,942,308
Crucible Steel	2,193,364	1,429,243
Pittsburgh Steel	1,971,820	1,236,111
Barium Steel	968,644	741,739
Allegheny Ludlum	2,098,370	1,459,813
Granite City	1,340,146	820,504
Detroit Steel	1,692,546	1,509,742
Alan Wood	674,347	411,558
Copperweld Steel	994,550	456,529
Rotary Electric	728,857	379,844
Keystone Steel & Wire	*1,377,661	*1,320,746
Continental Steel	401,213	353,071
Midvale Co.	294,648	332,030
Follansbee Steel	191,423	118,197
Harrisburg Steel	630,292	312,228
Carpenter Steel	931,872	789,042
Eastern Stainless	409,881	241,923
Acme Steel	1,420,777	1,776,892
Superior Steel	263,359	239,667

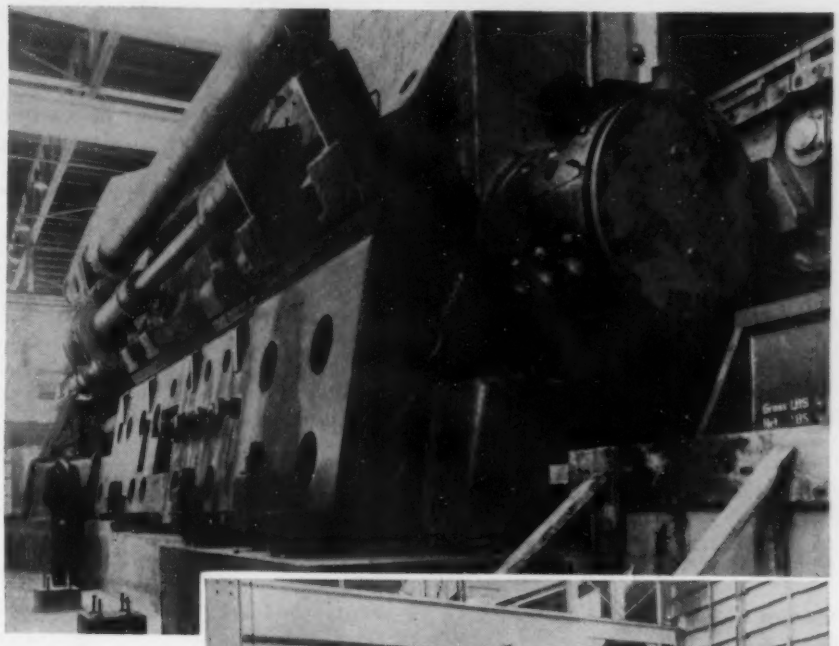
* Nine months ended Mar. 31.

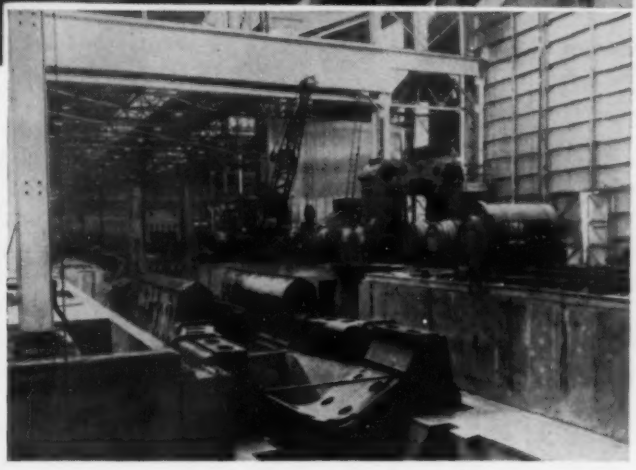
Heavy Presses

Installation of the nation's largest extrusion press at Aluminum Co. of America's Lafayette, Ind., plant has marked an important step in the heavy press program.

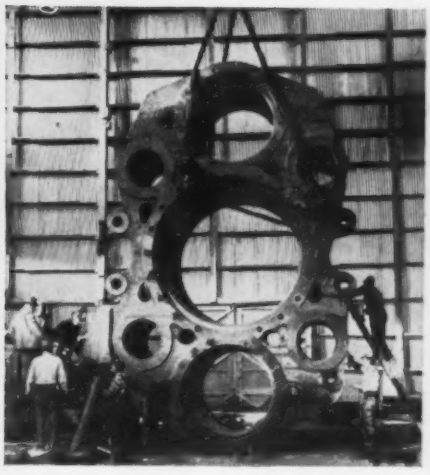
The 14,000 ton monster, made in Duesseldorf, Germany, was erected in a record 4 months by F. H. McGraw & Co., who began work last December. Erection was complicated by the need to translate metric calibrations and German specifications.

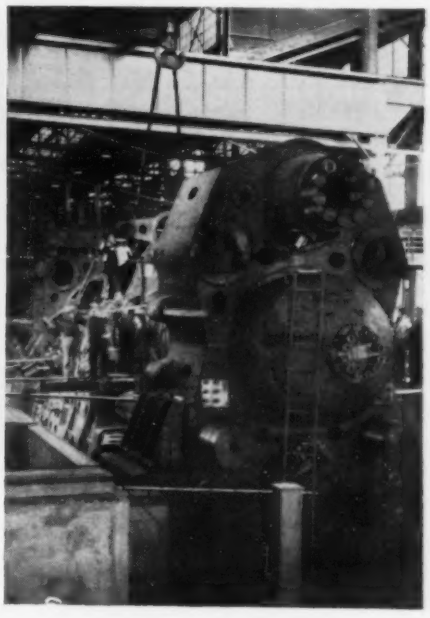
The government will have first call on output, presumably for aircraft sections, under a lease arrangement between Alcoa and the Air Force. But peacetime products could include aluminum oil country goods and curtain walls for buildings as well as alloy shapes for the transportation equipment.





COMPARE the finished job (top) with bare foundations (left) as they appeared on Dec. 1, 1952, when the installation job began. Above view shows massive base plates in position and heavy parts being skidded into the area.





GIANT STEPS are taken (left to right) as huge parts are added. Note size of men getting set to move the 107-ton cylinder housing in the center picture.

BUDGET: Clipped, Still Not Balanced

Trimming will probably total $10 billion . . . It won't make big difference . . . No large tax cuts this year . . . Ike proposes reorganization of defense plans . . . Would speed some output.

White House lopping of $8.5 billion from the Truman budget, plus a probable additional cut of $1.5 billion by Congress, won't make much difference in either overall government or defense expenditure for at least another 2 years.

Nor will it prevent the Defense Dept. from going ahead with the Vance plan for building and stockpiling special purpose machine tools and capital equipment — although defense spending will take the brunt of the cut.

Delays Tax Relief

The White House warns that it probably won't balance spending with income and most likely rules out tax relief for another year—or at least any appreciable cuts.

Reason is that the present administration inherited a backlog of $81 billion in undelivered defense and other orders. These will have to be paid for on completion.

Added to this must be the current appropriations for defense operations. In spite of any cuts this year, this means that the backlog of defense commitments will still be well over $100 billion.

Reshuffle Defense Plans

Two drastic actions were taken by President Eisenhower last week. First was the submission of new budget figures. Second was proposal of a reorganization plan for defense economy without harming mobilization and national security activities.

Bulk of the $8.5 billion slash, the President said, would come from the earlier defense and foreign aid budget.

While the Chief Executive steered clear of announcing a specific breakdown of the slash, dependable sources said this meant a probable cut of up to $6 billion for defense agencies and more than $1 billion for foreign aid.

This would mean 1954 defense appropriations amounting to around $41 billion. Added to the existing commitments of $81 billion, this sets up a minimum backlog of $122 billion as a prop to the economy.

Most radical policy change is the discarding of attempts to reach a peak war output year. Defense orders and military production are to be based on the theory that danger will persist for "years to come."

Under present policies, deliveries are to be speeded up on those items which "make most military sense" by reducing lead time. Orders for less essential production are to be stretched out.

Trim Vance Plan Funds

It is admitted that the Vance plan is not being discarded, or even postponed, under budget reductions. Mention of actual figures was avoided but it was indicated that new money would fall short of the committee's recommendation.

Sources close to the administration, however, hinted that the amount sought is between $200 million and $300 million. Committee recommendations were for $500 million annually for 10 years.

Biggest change in the military reorganization is proposal of six additional assistant military department secretaries and abolition of boards and committees, including the Munitions Board.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Replenishment of small arms parts, 984, $130,140, Michigan Tool Corp.

Replenishment of small arms parts, 500, $76,800, R. W. Kattenback Corp., Cleveland.

Replenishment of tank & combat vehicle parts, 1500, $75,420, The Budd Co., Detroit.

Replenishment of combat parts, 1400, $658,502, Sawyer Bailey Corp., Buffalo.

Replenishment of hardware, 400000, $224,535, Industrial Lamp Corp., Elkhart, Ind.

Replenishment of combat parts, 100000, $124,167, Eaton Mfg. Co., Detroit.

Replenishment of tank combat vehicle, 13100, $52,217, Thompson Products, Inc., Detroit.

Replenishment of tank & combat vehicle parts, 7000, $66,780, Liggett Spring & Axle Co., Monongahila, Pa.

Replenishment of hardware, 280000, $1,293,560, The Cleveland Chain & Mfg. Co., Cleveland.

Replenishment of tank & combat vehicle parts, 6100, $124,908, The Studebaker Corp., South Bend, Ind.

Replenishment of tank & combat vehicle parts, 20000, $52,720, Thompson Products, Inc., Detroit.

Replenishment of tools, 13893, $63,907, W. E. Richardson Machine Co., Inc., Birmingham, Ala.

Primer, percussion, 1200000 ea, $529,476, Simmons Co., San Francisco.

Telescope mount and spare parts, 312, $292,240, Weedsport Mfg. Co., Weedsport, N. Y.

Kit replacement, 33 ea, $305,180, Consolidated Vultee Aircraft Corp., Ft. Worth, Texas.

Clip, spring, ratchet, seal, sleeves, misc., var, $67,179, Bendix Aviation Corp., Sydney, N. Y., *A. W. Dietrich.*

Rocker assy, washer stud, screw, nuts, misc., var, $210,551, Continental Motors Corp., Muskegon, Mich.

Venturi, gasket, key, screw, pivot, covers, studs, plates, pins, misc., var. $255,145, Bendix Aviation Corp., South Bend, Ind.

Conduit, block, elbow, misc., var, $193,811, Titeflex, Inc., Newark.

Kit modifications of landing gear, misc., var, $266,225, Consolidated Vultee Aircraft Corp., Ft. Worth, Texas.

Pump, diesel fuel oil transfer, 24, $60,620, Walter H. Eagan Co., Inc., Philadelphia.

Turbine driven forced draft blower, 25, $996,215, Westinghouse Electric Corp., Washington.

Brass cartridge, 6500000, $1,413,000, Revere Copper & Brass Co., Inc., New York.

Container, ammo, metal, 243754, $1,231,000, Philadelphia Tinplate Co., Inc., Philadelphia.

Truck, garbage, compaction, 60 ea, $221,400, Gar-Wood Industries, Inc., Wayne, Mich.

Truck, garbage, compaction, 44 ea, $159,412, Leach Co., Oshkosh, Wis.

Truck, garbage, compaction, 44 ea, $158,620, Sicard Industries, Inc., Watertown, N. Y.

Spare parts, var, $92,600, Le Roi Co., Milwaukee, Wis.

Spare parts, var, $130,137, Waukesha Motor Co., Waukesha, Wis.

Spare parts, var, $92,462, Le Roi Co., Milwaukee, Wis.

Nut, 4961000 ea, $591,847, Delron Co., South Gate, Calif.

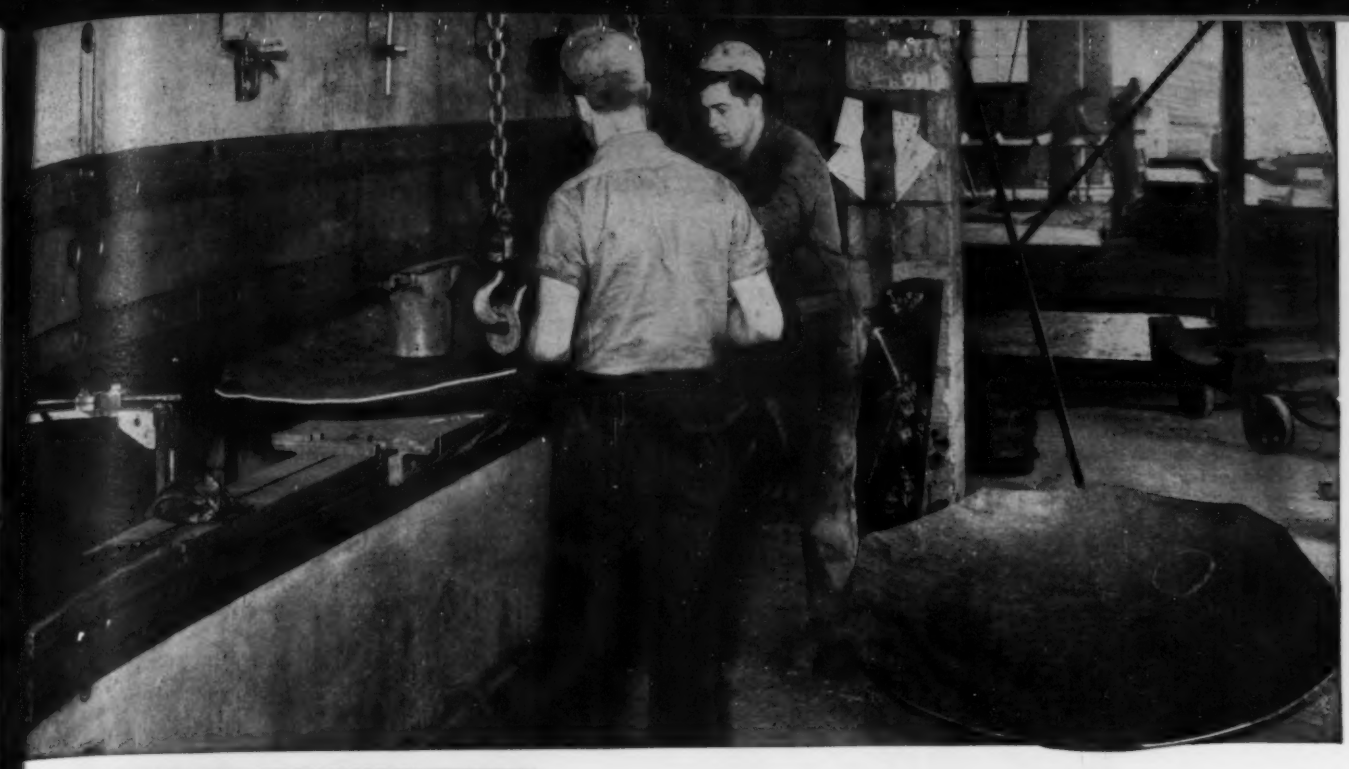
Wheel & brake assy, 82 ea, $128,443, Bendix Aviation Corp., South Bend, Ind.

Wheel & brake assy, 42 ea, Bendix Aviation Corp., South Bend, Ind.

Generators, 289 ea, $140,543, Bendix Aviation Corp., Teterboro, N. J.

Indicator, 7307 ea, $716,488, General Electric Co., Schenectady, N. Y.

Indicator, 4871 ea, $488,999, Sunbeam Corp., Chicago.



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Cincinnati All-Steel Press Brakes are used profitably for bending, punching, press work and a great variety of jobbing applications.

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SHAPERS · SHEARS · BRAKES

Industrial Briefs

Home In Indiana . . . INTERNATIONAL HARVESTER CO., now has a new motor truck sales and service branch at the corner of South Clinton & Duck Sts., Fort Wayne, Ind.

Sintering Plant . . . JOHN E. GREENAWALT, New York, has closed a contract to furnish a Greenawalt Sintering Plant to Companhia Ferro Brasileiro, S.A., Minas Gerais, Brazil.

Short Course . . . A 3-day Corrosion Control Institute course will be held May 19 to 21 inclusive at University of Wisconsin, Madison. It is being conducted by the University Extension Div., and College of Engineering with the cooperation of the Eastern Wisconsin Section, NATIONAL ASSN. OF CORROSION ENGINEERS.

Merger Approved . . . AMERICAN SMELTING & REFINING CO.'S stockholders approved the merger of Federal Mining & Smelting Co. into American Smelting.

Construction Underway . . . INDUSTRIAL MINERALS DIV., International Minerals & Chemical Corp., has started construction of a new refractory specialties plant at Janesville, Wisconsin.

Canadian Office . . . LEBANON STEEL FOUNDRY, Lebanon, Pa., has opened a Canadian Office at 304 Crescent Bldg., 1411 Crescent St., Montreal, Quebec.

Elected . . . PURCHASING AGENTS ASSN. OF CLEVELAND, INC., has elected W. E. Gombert, purchasing agent for Addressograph-Multigraph Co., its president.

Coming Up . . . Emphasis on the sea and shipping will mark this year's celebration of NEW YORK WORLD TRADE WEEK from May 18 to 22 inclusive.

Construction Planned . . . MONSANTO CHEMICAL CO., St. Louis, reports plans for construction of multi-million dollar facilities for the production of isocyanates.

Warehouse Completed . . . LURIA ENGINEERING CO. has just completed an 11,200-sq ft warehouse for the expanding Taubensee Steel Co.

For Advance Study . . . AMERICAN MATERIAL HANDLING SOCIETY'S Chicago Chapter has donated $250 to the Industrial Engineering Dept., of Illinois Institute of Technology, Chicago, to advance the study of materials handling.

Making History . . . Delta Power Tool Div., ROCKWELL MFG. CO., received the largest power tool orders in March in the company's history.

Honorary Degree . . . Norman P. Tisdale, manager of sales, MOLYBDENUM CORP. OF AMERICA, will be honored by Queen's University in Kingston, Ontario, Canada, on May 16 during graduating exercises with an honorary degree of Doctor of Laws.

Plaque Awarded . . . Robert S. Lynch, president of ATLANTIC STEEL CO., Atlanta, Ga., was honored at the annual meeting of the Kiski Valley Enterprises and the Vandergrift Chamber of Commerce, Vandergrift, Pa., with the Kiski Valley annual award in recognition of personal accomplishments and contributions to the American steel industry.

Appointed . . . THE R. K. LEBLOND MACHINE TOOL CO., Cincinnati, has appointed Sales & Service Machinery Co., Philadelphia, its sales representative in eastern Pennsylvania, southern New Jersey, Maryland, District of Columbia and Delaware.

First Decision . . . NATIONAL LABOR RELATIONS BOARD has decided that unions may no longer charge non-members fees for handling grievances. In its first decision on charges made for processing grievances the board held that the Taft-Hartley Act requires unions to provide equal treatment to both union and non-union members in plants where they represent all workers.

Friendly and Helpful . . . TRAILMOBILE, INC., for the second time in 4 years, awarded the Trailmobile Tank Truck-Trailer Trophy for the nation's outstanding record of safety and courtesy on the highways to Dan Dugan Oil Transport Co., Sioux Falls, S. D.

First Quarter Chases Year-End Blues

Strong first quarter cheers auto industry after 1952 disappointments . . . Gloom is over what might have been . . . Actual performance not too bad last year—By *R. D. Raddant.*

Generally sad notes reflected in 1952 annual reports in the auto industry were drowned out almost immediately by jubilant tunes of first quarter reports in 1953.

Actually, 1952 automotive earnings were not too bad, in spite of strict government controls, record taxes and a damaging steel strike. Earnings were generally over 1951, with but one exception.

Might Have Been . . . Reason for the melancholy tones of 1952 reports was not because of what earnings were, but what they might have been, had it not been for these restricting factors.

On the other hand, first quarter reports, now filtering out of the front offices, show the cheerful effects of full production, a healthy sales market, and no production controls. High taxes are the only remaining hangover of 1952's profit cutting influences. Defense cutbacks do not show as yet.

Set New Records . . . For example, General Motors reports first quarter unit sales of cars and trucks at the highest point since 1950 with first period dollar sales setting a new record. Net income was $151 million, but $346 million was set aside for taxes.

Packard shows sales and net earnings for the first quarter approximately three times those of the same period in 1952 with net earnings at $3,510,062. Profit before income taxes of $10,032,062 was the highest pre-tax earning of any quarter in the company's history to the present time.

Heartbreak Tooling . . . But not all was pleasure in the first quarter. A heartbreaking series of "unusual difficulties" with tools and dies for new models gave Studebaker a first quarter loss of $984,489. This may well turn out to be the one exception.

Nash, Studebaker's challenger for leadership among the independents, showed exceptionally good first quarter earnings, reflecting the general pattern of near-record profits (before taxes) for the first months of 1953.

No Cheers Yet . . . Automakers had no real reason to cheer 1952 profits, even if they did edge ahead of 1951. They generally reflected increased defense sales counterbalancing adverse effects of production curtailed by government quotas and the effects of the steel strike.

Nash was the single automaker to report a poorer year in 1952 than in 1951. A late model introduction and a generally lower level of defense orders hit hard into Nash profits.

Kaiser-Frazer showed an $8 million gain in 1952, but still was unable to reach the black side of the profit graph. Kaiser Manufacturing Corp. became Willys Motors, Inc., last week in a complicated financial transaction that defies description. Kaiser-Frazer is still the parent corporation, by virtue of its $62 million purchase of Willys.

Salvage Strike Loss . . . Effects of the steel strike which resulted in about 5 weeks of suspended production were noted in annual reports as cutting substantially into potential profits. In several cases unit loss was actually recovered before the end of the year, but the high cost of conversion steel and difficulties of manufacturing under short steel supply ate into profits that might have accrued later.

Nevertheless, third quarter profits salvaged the financial statements of several companies from a downward trend. Packard, for example, showed only about $3 million profit for the entire first three quarters compared with $2.5 million in the last.

Spending High . . . The past year was also characterized by tremendous expenditures for capital improvements and expansion. Some of these improvements were reflected immediately in lower production costs.

Ford, with its entire stock family controlled, does not publish an annual report. The eight companies reporting this year will be decreased by one in 1953 with the Willys sale unless, as a K-F subsidiary, Willys reports independently.

Six Still Leads . . . Accent is on the V-8, but the inline 6 is still the leader in engine production.

Of the industry's 18 producers, 10 have a V-8. But it is in the sales-heavy side of the industry, notably Chevrolet and Plymouth, exclusively 6 producers, and Pontiac, Ford and others where the 6 finds its sales strength.

Current rate of production gives V-8, 37 pct; straight 8, 11.9 pct; 6, 50.3 pct; and the 4, 0.4 pct. Last year the V-8 had 33.5 pct, the increase coming largely from Dodge and Buick, both of which introduced new engines this year.

Automakers' Net Earnings

1951-1952

	1952	1951
General Motors	$558,721,179	$506,119,560
Chrysler	78,696,599	71,973,469
Studebaker	14,291,789	12,623,130
Nash	12,603,701	16,220,173
Hudson	8,307,847	—1,125,210*
Willys-Overland	6,083,599	4,485,566†
Packard	5,618,263	5,594,060
Kaiser-Frazer	—4,711,876	—12,308,768

* Result of a tax-carry back of $2,183,455 for 1951.

† Fiscal year ended Sept. 30. Now sold to Kaiser-Frazer but to be known as Willys Motors Inc.

IG THREE: Will It Be Big Four?

K-F-Willys merger creates new automotive giant . . . Automakers wonder if it will threaten industry leaders . . . Some claim present setup unstable . . . Did K-F lose out on deal?

Will the Big Three become the g Four with the sale of Willys-verland to Kaiser-Frazer in the ansaction closed and completed st week?

Obviously, merging the two corporations creates a sizable industrial giant. Consolidated assets ach approximately $200 million nd net working capital some $60 illion.

But some automotive experts onder if K-F didn't miss the oat in some of the conditions of he sales of Willys. These conditions, apparently insisted on by ard M. Canaday, board chairan and president of Willys, may ave withheld from the flounderng parent company some of the hings it needs to gain ground.

Sales Stay Separate

Major surprise is that Willys, hich will retain its identity and maintain headquarters in Toledo, ill continue to market and serice its own products separately, s will Kaiser-Frazer.

It is no secret in the industry hat K-F's weakness has been in distribution. While the sale was still in the talking stage, it was assumed that Willys' sound dealer organization and merchandising program was one of its most attractive assets in the sale.

Can They Compete?

Second, the Willys passenger line and the Henry J are essentially competitive, although the Henry J chassis has been manufactured by Willys. While GM divisions frequently compete against each other, it is doubtful if the new organization is strong enough for internal competition.

But, for better or for worse, purchase of more than $60 million of the assets of Willys-Overland by Kaiser-Frazier's subsidiary, Kaiser Manufacturing Corp., was completed last week.

Up to now, the Henry J. Kaiser Co. had not put much of its own financial strength into K-F. Bulk of the financing has been by public stock sale or RFC loans. In the complex new setup, Henry J. Kaiser Co. is now at last in the automotive field to the tune of about $37.6 million.

Who Knows Best on Auto Steel?

Many a Detroit steel salesman admits privately he wished his home office would realize that the auto industry possibly knows more about its own business than does his Pittsburgh office.

Last week this was finally admitted by a top steelman, and one who may be closer to the auto industry than any other.

At the annual stockholders' meeting of the National Steel Corp., George R. Fink, president of National and its subsidiary, Great Lakes Steel Corp., said:

"Our progress has been so steady and consistent that we hardly realize the rapid rate at which we are growing, although we have considerable evidence that our customers, who always have been more informed than we, have realized this for some time."

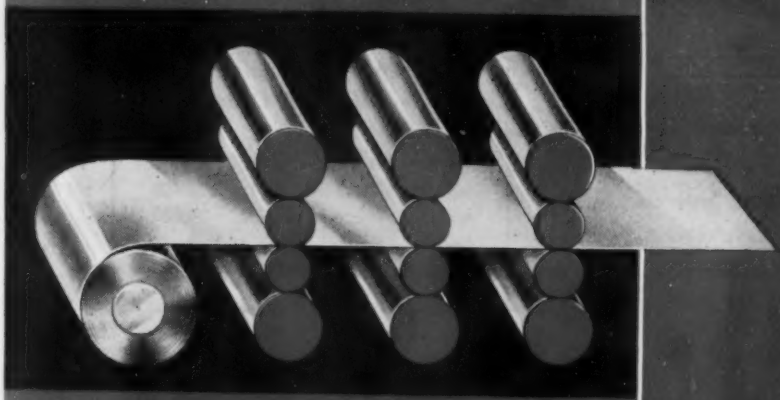
Mr. Fink should know. His Great Lakes Steel Corp., with an assist from Weirton Steel Co., supplies the auto industry with about 35 pct of its cold-rolled steel requirements. Increases in 1954 should boost this share of the market to 40 pct.

Automotive Production
(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
May 2, 1953...	152,264*	33,472*
Apr. 25, 1953...	100,912	27,490
Apr. 26, 1952...	159,945	34,665
Apr. 19, 1952...	104,171	29,970

*Estimated Source: *Ward's Reports*

THE BULL OF THE WOODS By J. R. Williams



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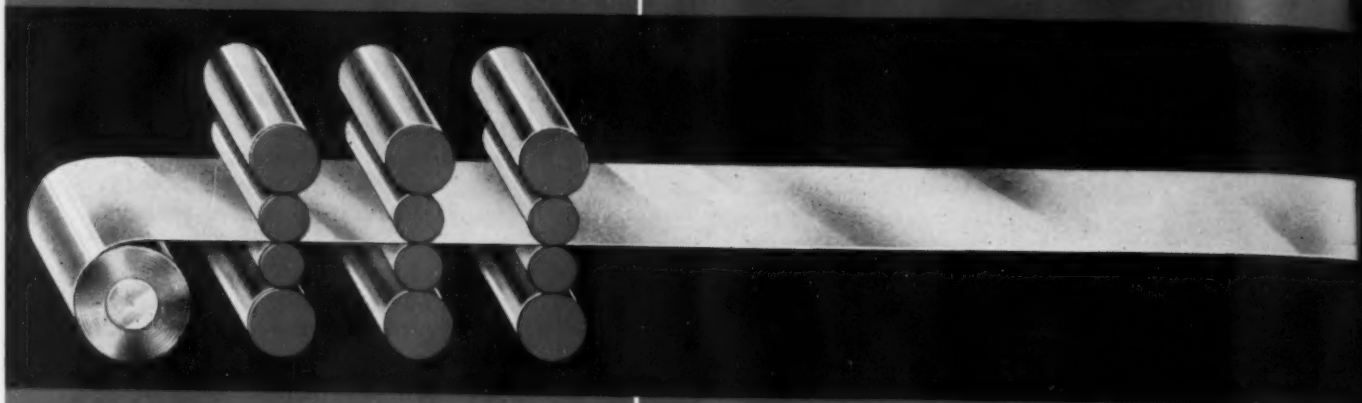

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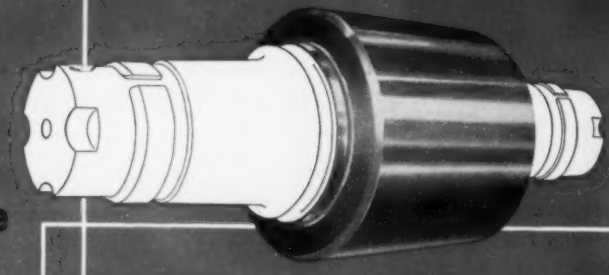

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Moscow Sweet Talk Won't Impress Ike

Defense spending will be cut $5 billion now . . . But output will be stretched out over long period of preparedness . . . More congressmen stand with Ike on taxes—*By G. H. Baker.*

"Threat" of peace by no means spells any major let-up in government defense buying, nor does it mean an end of the manpower draft. Instead, President Eisenhower's top policy-makers are thinking in terms of maintaining national military preparedness on a high plateau—and for an indefinite period of time.

Sen. Robert A. Taft, Republican leader of the Senate, said cuts in defense would slash $5 billion from the Truman budget request of $45.4 billion. The President intends cutting a total $8.5 billion from the Truman budget. Of this, $1.8 billion would come from the Truman foreign aid request of $7.6 billion. About $250 million may be deleted from the atomic energy program. Other cuts will hit government bureaus in varying amounts.

Quick Muscle . . . Some military production programs may be speeded up to add some quick muscle to our strength. But a $5 billion defense cut is still a big one. Consolation may be found in the Eisenhower thinking on long-term preparedness which spells long-term military output. Some of the frenzy may be bled from present planning but actually over the long pull more defense business may result.

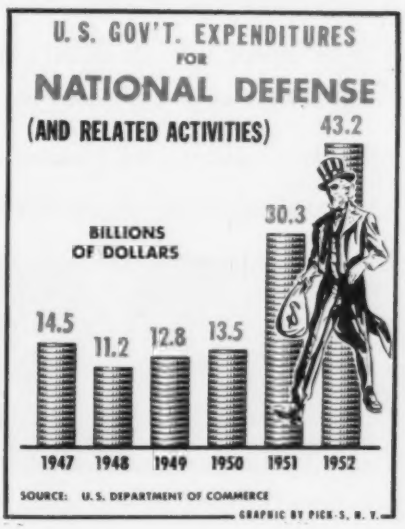
Pentagon's long-range plans for drafting manpower are usually a good tip-off to future programming of industrial mobilization. That Defense Dept. intends to seek renewal of the draft law (it expires 2 years from now) is a good indication that Moscow "peace" talk won't beguile Washington into dismantling industrial mobilization.

Toss of Coin on Tax . . . President Eisenhower's firm stand against tax reduction until the budget is balanced is winning new converts among both Republican and Democratic members of Congress. As a result, there is at present only a 50-50 prospect that the excess profits tax will be allowed to expire on June 30.

Endorsement of the White House position last week by Sen. Harry F. Byrd, D., Va., is helping a number of on-the-fence congressmen to make up their minds. For Mr. Byrd's wisdom in fiscal matters has won him an important place in congressional policy-making circles.

He Was Ignored . . . Chairman Daniel A. Reed, R., N. Y., of the tax-writing House Ways and Means Committee, insists the time is ripe for tax reduction. Normally, the views of the chairman of this all-important committee would prevail on the floor of the House. But Mr. Reed has been over-ruled—to his astonishment and indignation—and control of tax legislation has been transferred unofficially to the House leadership.

The excess-profits tax is assuming the proportions of a test issue. If the Administration is successful in convincing congress that this tax should be continued for 6 months—or even 1 year—the prospects for scheduled cuts in income taxes also become more remote.



Small Plant War Work . . . Aircraft manufacturers are continuing large scale subcontracting to smaller firms, a new Senate survey discloses.

Subcontracting lends itself more readily to the aircraft industry because of the sudden need to expand output. But the Senate survey complains that other large military contractors are inclined to subcontract to other large military contractors and not to smaller firms.

As far as defense subcontracting is concerned, small business plays a large part numerically, but a smaller part financially. Generally speaking, the Senate report finds that small business participation in prime defense contracting is "disappointing." Its share of the defense pie has shrunk steadily since Korea.

Prime contractors have passed about 57 pct of their fees to other concerns. But only about 24 pct of the subcontract dollar went to smaller firms.

Opportunities for smaller firms to play a more active part in the defense program is there, the Senate believes. Alert and aggressive inquiries and salesmanship can reverse the current downtrend in defense order subcontracting.

Nickel Clean-Up . . . Topflight men from the industry are to be assigned to Washington over the next few weeks to help National Production Authority to clean up its backlog of nickel allotment problems.

A plan is shaping up to cut down on red tape and other road-blocks. Control regulations are to be amended so that nickel will be distributed only to consumers with an established base period usage and who use the nickel only in their own plants.

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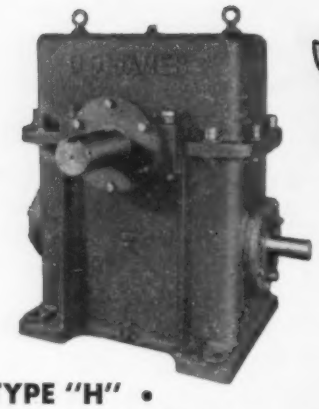

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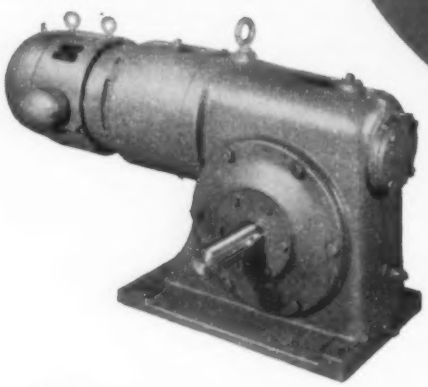

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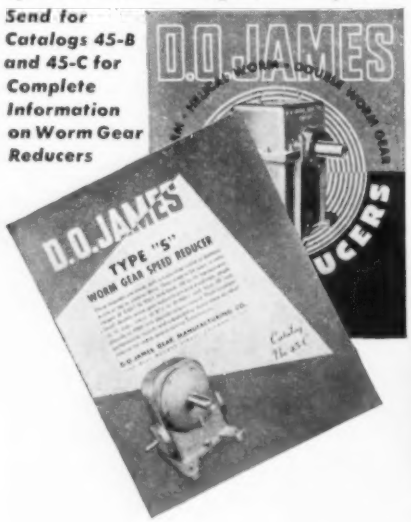

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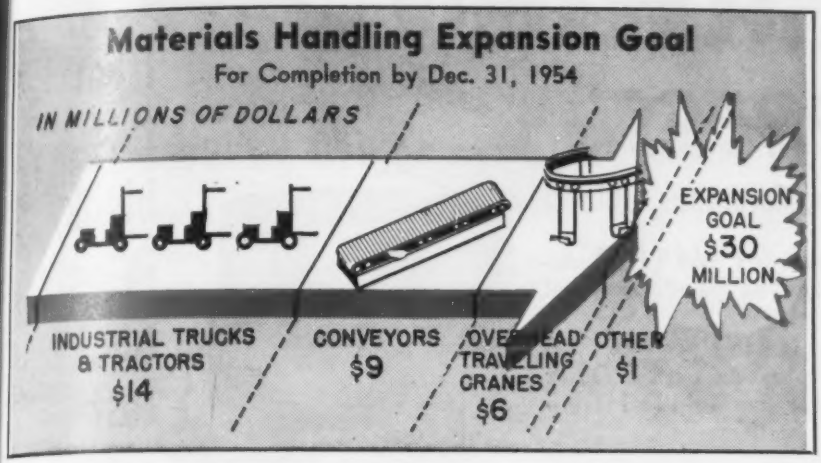

GROWTH: Tall Materials Handling Goal

Washington pushes 25 pct growth of field over 1950 . . . Estimate output at $1.2 billion now . . . Add to expansion timetable . . . Need more fork lifts, conveyors—*By Karl Rannells.*

Backing up its belief in continued high levels of consumption-production, the Office of Defense Mobilization says U. S. materials handling manufacturers will have to boost plant investment 25 pct over 1950 in order to meet future demand.

There is some argument as to the actual manufacturing capacity of the industry. Reason is that sizeable quantities of components such as electric motors are made by other industries.

But there is no question that, on the basis of completed output, the industry has soared up into the billion dollar circle. According to National Production Authority statistics, the current production rate is hovering around $1.2 billion.

Likewise, NPA estimates the industry's capital investment in plant capacity at about $125 million as of late 1950. This may be a conservative figure.

Extends Expansion Goal

Then Defense Production Administration looked over the situation. It recommended that the industry add $26 million worth of production facilities to existing capacity to meet suggested goals.

Since that time, the government has issued certificates of necessity and fast tax amortization covering practically all of this original expansion goal.

Recently ODM reviewed the long term outlook. Late last month ODM decided the original expansion goal had been too conservative and recommends an additional $4 million in plant capacity should be built between now and the end of 1954.

This would bring total expansion since Korea to $30 million. It would increase the industry's total investment in plant capacity to about $15 million.

What Is Covered

The goal includes only facilities for turning out major classifications of materials handling equipment such as industrial trucks and tractors, fork lifts, conveyor systems and equipment, and varied types of cranes, hoists, and monorail systems.

It does not cover such products as ammunition boxes, steel drums, and other fringe items. Several of these have their own individual expansion goals.

Nor does does it include equipment and machinery for the mining industry. Mining equipment goals were also recently revised.

Latest goal urged for this type of machinery is about $4 million in new production facilities. It would increase the industry's total capital investment to around $285 million.

Biggest need for expansion within the materials handling industry has been additional capacity for industrial trucks and tractors. Second highest need has been new capacity to turn out conveyer equipment.

Under the present expansion goal, ODM has set $14 million as the tentative figure for which it will issue certificates to manufacturers of industrial trucks and tractors.

The figure for powered conveyor equipment has been established at $9 million. Another $6 million has been earmarked for overhead traveling cranes.

The remaining $1 million in certificates for the overall goal is to be held out for other types of cranes, hoists, monorail systems, and so on.

Have Few Figures

Few concrete figures as to actual unit production needs have been worked out. Trouble has been that the government has been slow to recognize its importance.

Census Bureau information is incomplete in coverage and far from current. Statistics collected by the War Production Board were misplaced in postwar reshuffling.

Commerce Dept. may change the situation. Present plan is for a small materials handling section when the trimmed-down NPA is absorbed by the Office of Production, Distribution, and Economics now being set up.

Approve Electric Power Projects

Office of Defense Mobilization has approved tax amortization certificates for 13 new electric power projects.

Certificates have been issued covering nearly $92 million, or about 38 pct, of the total cost. It is estimated that completion of these projects will increase power capacity by 21.5 million kw.

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West Becoming Major Shell Producer

Norris-Thermador's Riverbank plant largest to date . . . Converted from wartime aluminum plant . . . Three of seven lines now in place . . . Will be prime steel user—*By T. M. Rohan.*

The Free World's largest shell plant to date was formally dedicated in California last week.

Present plans call for production of 480 shell cases per hour from each of seven lines at Norris-Thermador's $25 million unit at Riverbank. Bechtel Engineering of San Francisco has been at work since late 1951 converting a wartime aluminum plant to shell production, recently completed installation on the third line.

Shell cases are deep drawn from medium carbon plate steel 0.56 to 0.65 in. thick by a method substantially similar to the one Norris-Thermador has used at its Los Angeles plant since early in World War II. The new facility will be an important western steel consumer when in full production.

Who Makes It . . . Sole western plate producers are U. S. Steel and Kaiser. Other major sources are Bethlehem, Armco and Inland who in some cases supply ready-cut annealed blanks ranging from 7½ to 10⅝ in. diam.

Western plants are heavy suppliers of shell quality billets for projectiles. An important source is U. S. Steel's Torrance plant. First production started there about 6 weeks ago after transfer of the work from the Geneva, Utah, plant.

Convert to Ordnance . . . The Riverbank plant is one of three practically identical U. S. wartime aluminum plants converted to ordnance manufacture in the last few years. Others are in Louisville, Ky. (also set up by Norris-Thermador and Bechtel), and Louisiana. Both have projectile lines in addition to shell case lines, making the California unit the largest shell case manufacturer.

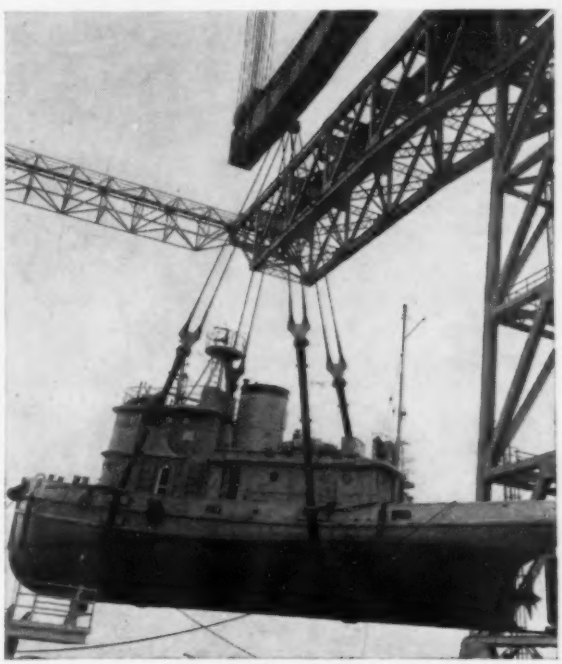
The Riverbank plant is considered ideally located from a logistics standpoint for supplying Pacific operations. It is also close to steel producers and will utilize workers attracted to the area by the original plant, although it never got into full aluminum production.

The lines consist of 59 presses ranging from 75 to 4500 tons in 563,000 sq ft of floor space. Conversion of the plant includes installation of over 1100 major pieces of equipment.

Ready to Go . . . The second largest independently owned steel mill in California—Pacific States at Niles—is getting ready for big business ahead. Owned jointly with the adjacent American Forge Co. by the Jos. Eastwood Jr. family, expansion of ownership is possible.

American Forge claims the world's largest potential capacity for forging grinding mill balls—60,000 annual tons under optimum conditions. It currently is devoting substantial production to this growing market. Mining of precious metals has furnished the major market, but greatly accelerated low grade copper ore mining in Nevada and Arizona is expected to increase output considerably. Current production is about 20,000 tons annually, principally high carbon tool steel and moly chrome alloys.

Grinding balls are the major mass-production item, but the firm handles forgings to 75 tons and supplies many large diesel engine crankshafts. Milo Spaich, general manager of both firms, says Pacific States is currently shipping 12,000 tons monthly and has a foundation for a fourth open-hearth in addition to the three 150-ton units. Two 25-ton electrics are on wartime standby together with a 4500-ton government-owned press at Berkeley.



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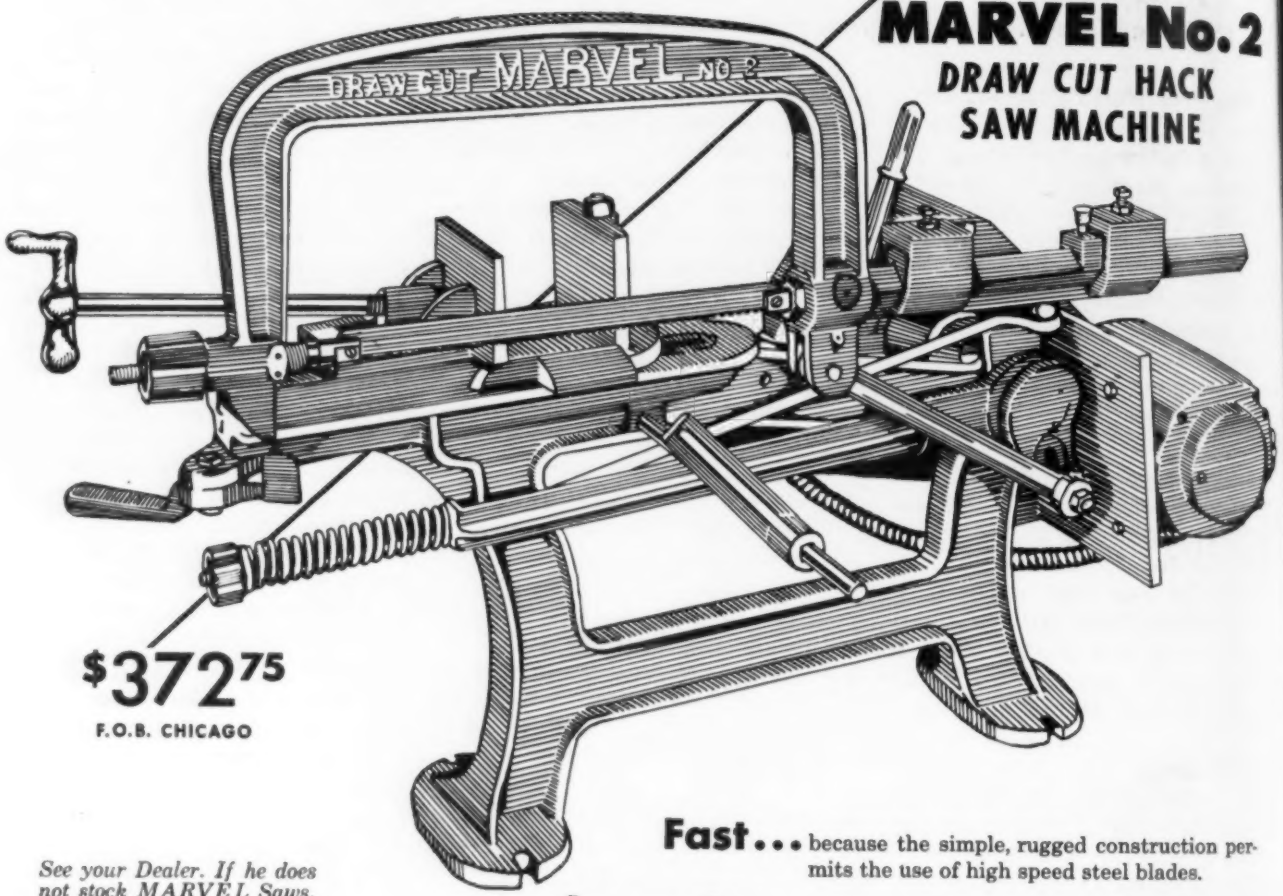

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Pressure Eases on Automotive Tooling

Speed up of engine programs is expected as defense cutbacks take pressure off machine tools . . . Report cancellation of jet engine contracts . . . More will be coming—By *E. C. Beaudet.*

Bright spots are starting to appear in the automotive tooling picture. Since Korea, automobile manufacturers have been hard pressed to meet new tooling requirements. Present indications are that engine programs now under way will go ahead at a faster pace.

Reason for the anticipated speed up are the easing of rated backlogs for machine tools due to actual defense cutbacks and because of anticipated reductions in future defense requirements.

Experience Counts . . . Coupled with these factors, which tend to reduce tooling time, is the experience gained by automotive producers in improvising tooling for production of new models. Master mechanics at various engine plants have been able to overcome many delays in shipments of machine tools by revising the tooling used on former engines until new equipment is placed in the line.

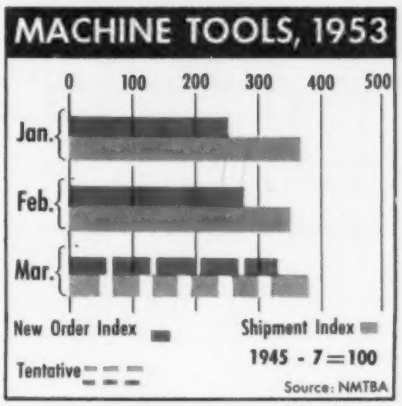
In one instance this kind of improvisation was partially responsible for permitting manufacturers to make changes in three models instead of the one originally planned for modification.

May Finish Sooner . . . The two principle engine programs being worked on in the Motor City are being carried out by Chevrolet and Pontiac. Although it is speculative whether these programs will reach completion in time for next year's models, the unexpected break in the tooling may permit completion of tooling programs several months earlier than first expected.

Concrete evidence of the change in the tooling industry was indicated last week as tool and diemakers throughout the country reported a switch in business in the last 2 months from a ratio of 80 pct defense and 20 pct civilian orders to 40 pct defense and 60 pct civilian business.

Cancel Jet Orders . . . Cancellation of jet engine contracts recently provide further proof of the diminishing importance of government buying to the machine tool industry.

A short time ago the Navy cancelled its $154 million order with



Ford Motor Co. for the manufacture of J-40 jet fighters. The engines, to be made by Ford under a license from Westinghouse, were expected to start rolling off production lines at a new $50 million plant in Romulus, Mich.

The plant, still under construction, may be taken over by Ford for its own production.

Cut One-third . . . In other moves the Air Force cancelled orders for J-47 jet engines manufactured by Packard and Studebaker under license from General Electric Co. Amount of the cutback accounted for about one-third of the orders on the books of the two firms. As a result their contracts are expected to terminate next summer.

GE is also stretching out its jet engine production. Reason given for the stretchout was that operating performance of the engine surpassed previous expectations and that they could be kept in service longer without major overhaul.

More Coming . . . More jet engine production cutbacks are expected under Defense Secretary Wilson's plan to concentrate defense production in the hands of prime contractors.

Rumor has it that other contracts held by non-prime contractors will be slated for cancellation. In some cases the cancellations may be for the purpose of initiating production of a different engine in a plant, with the original model being shifted to another facility.

Rumors of cutbacks seemed bolstered last week by President Eisenhower's proposal to cut the national budget by $8.5 billion. Of this amount about $5 billion is slated to be cut from defense appropriations.

Expansion Slows . . . Expansion of the machine tool industry and its demand on the manpower supply is slowing down, according to a recent survey of 211 machine tool companies by the Labor Dept.

Labor Dept. officials claim the expansion has reached the point where industry can meet the demands of both military and civilian users.

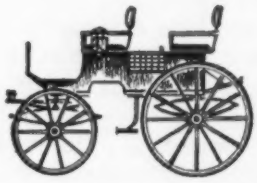
Employment Increased . . . During 1952 industry employment increased about 4 pct and, since the start of the mobilization program, overall industry employment has increased 70 pct.

Only eight of the 211 plants surveyed reported production delays which could be directly attributed to insufficient manpower. Others reported they were unable to hire as many skilled workers as they would like but said the shortage was not proving a serious handicap to operations.

THE BAKER-RAULANG CO. 1853 100th anniversary 1953 THE BAKER-RAULANG CO.

A CENTURY OF TO

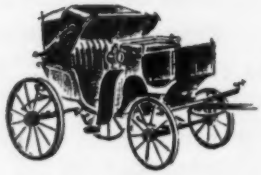
tops in 1853



WAGONS and CARRIAGES

100 years ago our company started in business as a blacksmith and wagon shop.

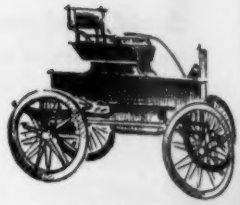
tops in 1890



DE-LUXE CARRIAGES

Skilled craftsmanship soon earned the reputation of producing the country's finest custom-built carriages.

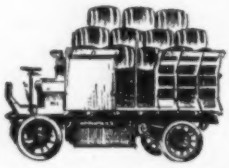
tops in 1898



FIRST BAKER ELECTRIC

This electric "horseless carriage" wa Walter C. Baker in the motor ve business.

tops in 1910



FIRST ELECTRIC ROAD TRUCK

Durability and economy made this the best commercial vehicle in its day. In two years it was accepted in over 100 different trades.

tops in 1912

ELECTRIC "PADDY WAGON"

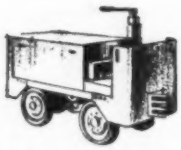
Catalog description: ". . . economy in your police department compared with horse drawn patrol . . . desirability from a *humane* and *sanitary* viewpoint".

tops in 1915

FIRST AUTOMATIC TRANSMISSION

The handsome "Owen Magneti Baker-built gas powered automobile w electric drive predated other automa transmissions by 30 years!

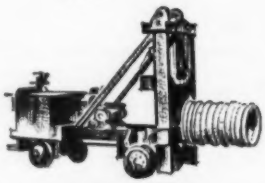
tops in 1917



FIRST BAKER INDUSTRIAL TRUCK

Baker pioneered mechanized material handling, entering the field 43 years ago. First Baker Industrial Truck, built in 1917, is still in daily use.

tops in 1922



FIRST RAM TRUCK

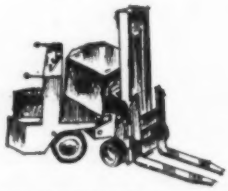
The first cantilever type self-loading industrial truck with mast and carriage for lifting loads mechanically. *FORE-RUNNER OF ALL FORK TRUCKS!*

tops in 1924

FIRST "LOCOMOTIVE" CRANE

Designed originally for assembly a maintenance of locomotives, the mo electric crane was quickly accepted f wide variety of industrial handling jo

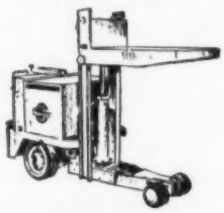
tops in 1936



FIRST ARTICULATED FORK TRUCK

Radical design which steered by pivoted frame. Used for stacking in warehouses with narrow aisles and for certain car-loading operations.

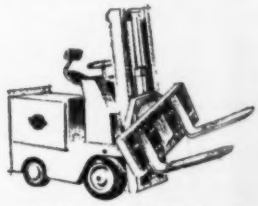
tops in 1942



FIRST HYDRAULIC HI-LIFT

The first hydraulic lift for a Hi-Lift Platform Truck was introduced by Baker during this year.

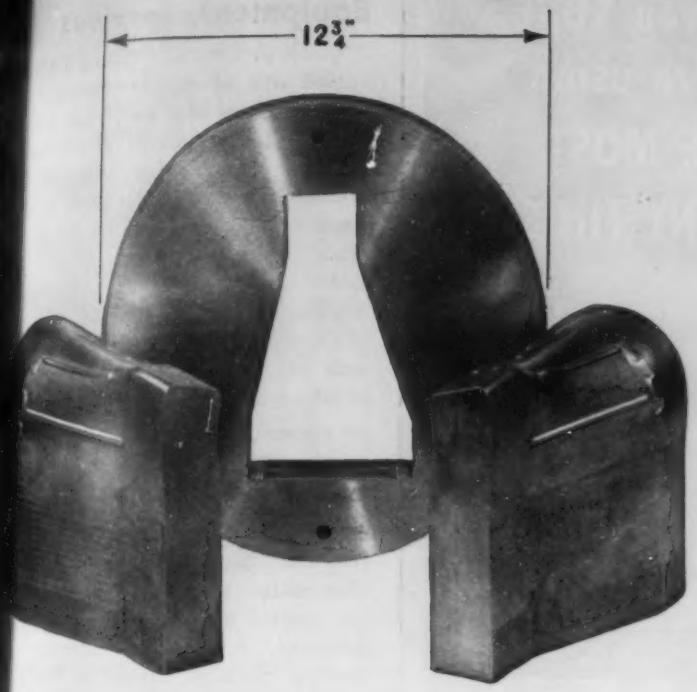
tops in 1952



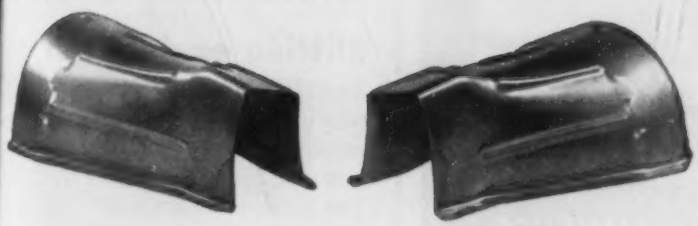
FIRST ALL PURPOSE TRUCK

Combines fork clamping, spacing a side-shifting. With revolving head adde produces the "Octopus", which hand any shape load and stacks it in u position.

Just this tooling ...



makes 2 drawn parts...



by Hydroforming

What would it cost you to tool this job?

HYDROFORM TOOLS ARE CHEAPER TO MAKE

The parts illustrated below are right-hand and left-hand sections of a stainless steel duct—a jet-engine component. The one draw ring shown was used to Hydroform *both* parts, by simply turning it upside down to draw the opposite section. The punches were made of cast iron, machined to shape.

Liberal clearance is permitted between the punch and draw ring—up to 50% of the thickness of the material being drawn. Punches can be made of inexpensive, easy-to-work materials—mild steel, brass, Kirksite, plastics—depending upon the material and shape of the part.

GET BETTER PARTS... BIGGER SAVINGS... BY HYDROFORMING

You'll save on tool costs, *certainly*, by Hydroforming—and produce parts of *higher* quality, in *fewer* operations as well. Bulletin M-1759-1 gives detailed information on this simplified deep drawing process. Write for your copy. For data pertinent to your production, call in a Cincinnati Milling field engineer.

CINCINNATI

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U.S.A.

Hydroform

—Free Publications—

Continued

Equipment, services

A quick picture of Whiting Corp.'s varied line of equipment and services is given in a new 16-p. handbook. As an example of the wide range of industries serviced by Whiting, the company has aviation, chemical processing, materials handling and transportation equipment and engineering and metal working machinery divisions. Many of the company's services and products are described in the booklet *Whiting Corp.*

For free copy circle No. 14 on postcard, p. 171.

Cement handling

The new Model PM-1 Blastcrete Gun has been redesigned to provide easier, faster loading and better control of cement flow and air pressure. A new slide valve in the loading chamber makes it possible to adjust material flow to any desired amount or to cut off material instantly when free air is desired to blow out a line. Complete details on this unit are contained in a new bulletin. *Blastcrete Equipment Co.*

For free copy circle No. 15 on postcard, p. 171.

Slitting equipment

Basic information on design, selection and operation of slitting equipment is contained in Yoder Co.'s new coil and sheet slitter catalog. The publication contains time studies, analyses of operating cycles and a discussion of coil handling and scrap disposal. Engineering data on Yoder rotary gang slitters, uncoilers, scrap choppers, recoilers, coil car unloaders and other equipment is also given. *Yoder Co.*

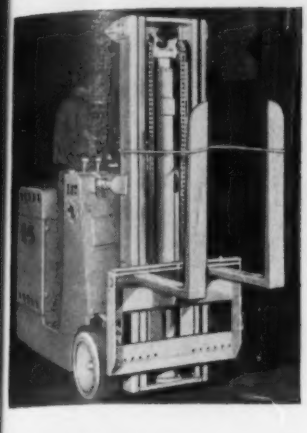
For free copy circle No. 16 on postcard, p. 171.

Core binding

Use of Cyacor resins as core binders is the subject of a new booklet published by American Cyanamid Co. Available in two types, Cyacor 151 is an extremely stable, dry, powdered urea-formaldehyde resin said to be particularly effective for dry sands. Cyacor 191 is a slow viscosity urea-formaldehyde resin solution that can be used with both wet and dry sands. *American Cyanamid Co.*

For free copy circle No. 17 on postcard, p. 171.

HANDLING HELPS by A.L.L.



Folding Forks

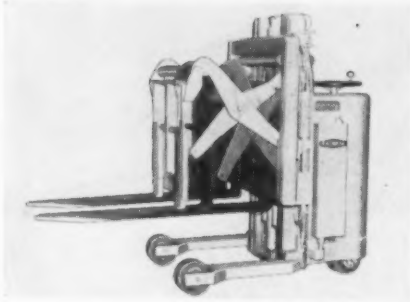
Here's an idea developed by G. E. They wanted to be able to operate this Lewis-Shepard Fork Truck on both 1st and 2nd floors . . . but its overall length was too much for their elevators. Solution: a simple addition of two rods holding the shaft-hung forks as they are swung to the up position. It cuts 15 inches off the length of the truck. Result: one SpaceMaster Electric Fork Truck going up.

A Handy Dandy

There are many types of hand operated equipment that can serve as valuable support to your power line. This L-S Handy Hoister is a good example. It is designed for one-man operation on loads up to 2000 lbs. It pushes easily on roller bearing wheels . . . floor lock prevents movement in racking. It may very well be the answer to a problem in your shop. Write for the full story. *Lewis-Shepard Products, Inc., 415-5 Walnut St., Watertown 72, Massachusetts.*

NEW EQUIPMENT

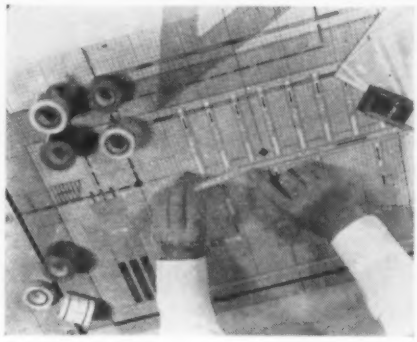
New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 171 or 172.



Tiering truck has that boarding-house reach

Forks on a new electric tiering truck reach right out to pick up or deposit the load. Reach-Fork makes narrow storage aisles practically in every warehouse. It will right-angle tier from any 6-ft aisle due to its unique fork action, short length and off-set drive wheel with 200° turning arc. Its forks actually extend 24 in. and back in a few seconds. Pallets of any size can be handled without changes in the truck. They can be stacked close together since no space is needed between loads to accommodate the base forks. Truck has a 51-in. free lift. *Raymond Corp.*

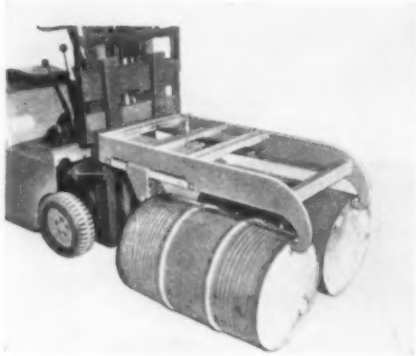
For more data circle No. 18 on postcard, p. 171.



New layout tapes represent material conveyers

A new method of preparing industrial layouts employs pre-printed components. These are pressure-sensitive draftsman-drawn tapes representing material conveyers and structural components, scaled ¼ in. = 1 ft. Other tapes used in this system consist of broken and solid lines, reference numbers and letters and colored arrows. With the use of directional arrow patterns in several colors, excellent flow charts can be produced to indicate step-by-step processes through machines or through plant operations. All tape patterns are available on rolls of transparent self-adhering tape, and many patterns are also opaque tape. *Chart-Pak, Inc.*

For more data circle No. 19 on postcard, p. 171.



Drum handling attachment adjusts to drum size

A horizontal drum handling attachment completely interchangeable among Clark Equipment's line of fork trucks is semiautomatic, quickly and easily adjusting itself to a variety of drum sizes for horizontal lifting and tiering. It can handle drums ranging in overall length from 26 to 38 in. Drums can be handled empty or full, singly or in pairs. The drum handler consists of two parallel arms with self-actuating levers projecting forward for horizontal drum grasp. Construction is of heavy plate. The attachment requires no tools for mounting or dismounting. It is suspended from standard truck forks *Clark Equipment Co.*

For more data circle No. 20 on postcard, p. 171.

Light stock manipulator for forge shops

The Manipulet embodies a new principle in manipulation, furnace charging and drawing, and hot stock handling of forging stock up to 1500 lb in weight. It converts a standard lift truck into a forging manipulator by incorporating into its design a hydraulically actuated manipulating apparatus. The truck serves as a carrier and provides hydraulic power. Ample overload safety margins provide a rugged, serviceable durable machine for continuous hard use. One man operates the Manipulet. *Salem-Brosius, Inc.*

For more data circle No. 21 on postcard, p. 171.

Turn Page

Loader conveys materials from hopper to furnace

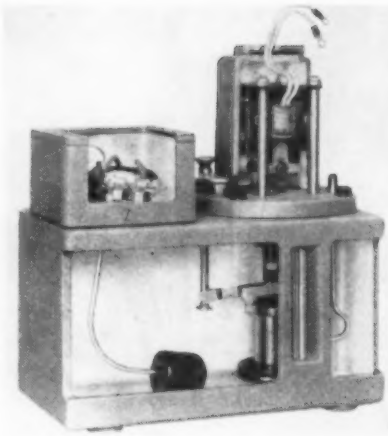
With a new heat treat furnace loader one man can load from 500 to 4000 lb per hr of small stampings forgings or castings to the full capacity of the furnace for an indefinite run. Called Man-O-Steel, the loader automatically removes material from a hopper and discharges it in even and metered quantities into an endless belt type heat treat furnace. A series of synchronized vertical-moving pushers remove parts from the hopper, raising them to the next level and causing them to roll off by the force of gravity. The material continues in this way through a series of cycles until discharged into the furnace. Average dimensions of the Man-O-Steel is 10 ft high x 8 ft long. It is made of steel parts, complete with drive, variable speed controls, overload safety clutch, reversing starters and pushbutton controls. *Michigan Crane & Conveyor Co.*

For more data circle No. 22 on postcard, p. 171.

Handling loads between truck floor and dock

The Load-O-Matic, an automatic loading platform, handles loads between truck floor and loading dock. It is started from the loading dock when the front wheels of the materials-handling truck touch a switch bar in the floor of the loading platform, actuating the hydraulic lifting mechanism. A leveling ramp automatically stops the Load-O-Matic when the platform is in the same level plane as the truck floor and bridges the gap between, whether the truck floor is above or below the loading dock. The trip back is automatically started when the truck touches the switch bar from the opposite direction. Standard Load-O-Matic offers a traverse of any 30 continuous inches between a point 30 in. above loading dock and 30 in. below. *Field Engineering Co.*

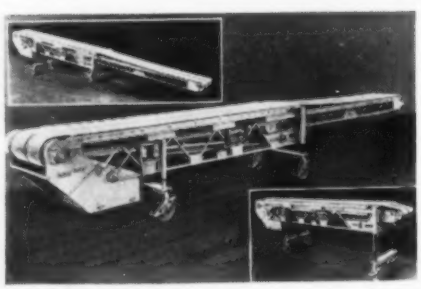
For more data circle No. 23 on postcard, p. 171.



Lubricating system offers control flexibility

A solenoid-operated lubricator, Type E, can be applied to almost every type of machine and mounted in any location; no connection to a moving element of the machine is required. Great flexibility of control is one of its chief features. The lubricator can be actuated by switches tripped by rotary or reciprocating motion, existing control circuits, electric timer controls, or pushbuttons. It delivers from .8cc to .2cc of oil per stroke; maximum frequency of operation is recommended at 4 strokes per min. The solenoid is rated at 4 amp, 110 v, ac. A float switch control can activate a visible or audible alarm when the oil supply is low; then if the supply is not replenished, the switch will shut off the machine, preventing serious damage to bearings. *Bijur Lubricating Corp.*

For more data circle No. 24 on postcard, p. 171.



One conveyer handles many different jobs

The Expand-O-Veyor can be set high or low, long or short, or at any angle in either direction, to suit varying requirements. It solves the problem of handling different jobs in areas where only one conveyer can be used, due to space or budget limitations. For loading trucks and similar operations it is possible to move the discharge end of the conveyer without moving the conveyer itself. Smaller unit is adjustable from 11 to 18 ft in length; larger, 15 to 25 ft. *A. B. Farquhar Div., Oliver Corp.*

For more data circle No. 25 on postcard, p. 171.

Turn Page

...with TYCOL lubricants on hand!

Heavy-duty cutting operations? Here's what happens when you switch to Tycol Afton oils! A well known Engineering Company (you'd recognize the name instantly) recently tested cutting oils used to shape 14" gears on a Gleason Bevel Gear Generator. Their findings: after the first rough cut around, with competitive oils, they had to grind a full ⅛" off the cutter. With Tycol Afton 8, they hobbed *two* gears and took off only .013". Afton oils are non-corrosive . . . and so stable they're widely recommended as hydraulic oils! They serve a triple function as coolants, lubricants, and hydraulic media on the same machine . . . the heavier the cut – the better they perform. It will pay you to find out why – by contacting your local Tide Water office!

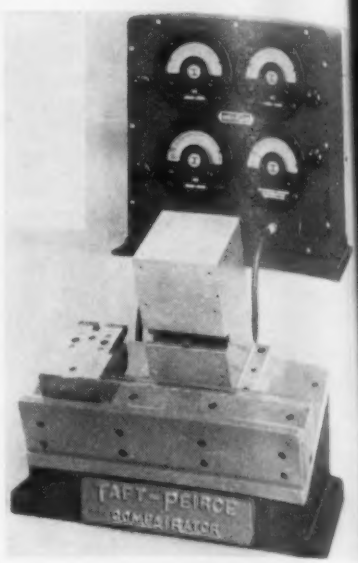
Over 300 Tycol industrial lubricants are at your disposal . . . engineered to fit the job!

REFINERS AND MARKETERS OF VEEDOL . . . THE WORLD'S MOST FAMOUS MOTOR OIL

TYCOL
INDUSTRIAL LUBRICANTS

Boston • Charlotte, N. C. • Pittsburgh
Philadelphia • Chicago • Detroit
Tulsa • Cleveland • San Francisco
Toronto, Canada

TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE . NEW YORK 4, N. Y.



Inspection gage

An air-operated gage measures the dimensions over rolls of serrations in the root section of jet engine turbine blades. The gaging fixture is made with tungsten carbide contacts, precision ground to a radius corresponding to the required roll dimension. Contacts are mounted so that they are free to move in vertical and horizontal direction, positioning themselves correctly, regardless of any permissible lead variations that may exist in the serrations. Three air indicators show dimensions as measured over rolls on each of the three serrated sections. A computing indicator automatically computes the difference between the amounts that each of two dimensions varies from its mean value. Inspected part is rejected when variation is greater than ± 0.001 in. No special operator skill is required to obtain accurate readings. *Taft-Pierce Mfg. Co.*

For more data circle No. 26 on postcard, p. 171.

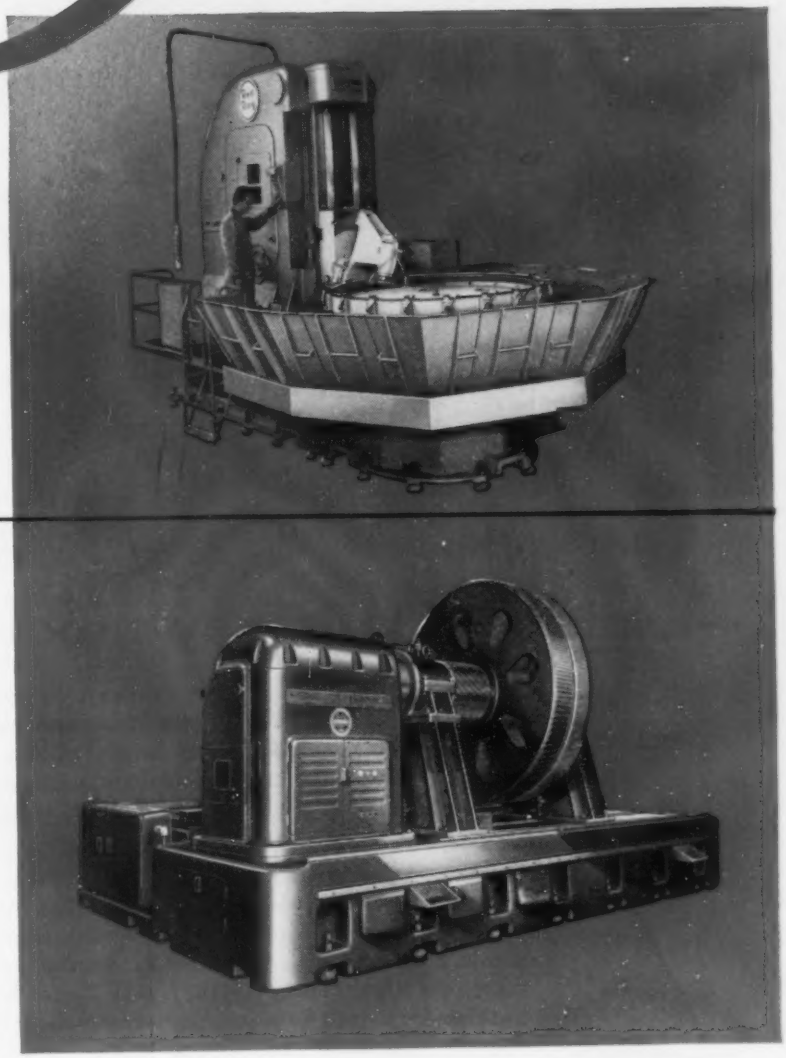
Streamlined crucible

A new line of large-sized barrel crucibles have a more severe taper towards the bottom, which is said to allow for greater combustion space. Each base in different sizes is not more than half the maximum diameter and not more than half the height. The crucibles are said to melt metals quicker. *Electro Refractories & Abrasives Corp.*

For more data circle No. 27 on postcard, p. 171.

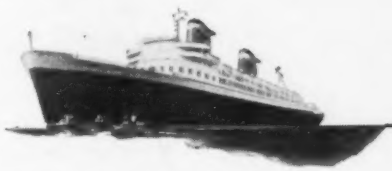
Turn Page

Large marine gear finishing practice moves ahead



ABOUT 11 years ago the first Red Ring machine for shaving large marine propulsion gears (up to 96″ PD) was completed and put into commission. Its high precision and spectacular economy promptly initiated the now accepted practice of shaving for such gears.

Since then Red Ring machines have been built to shave larger ma-



rine gears. The United States, our fastest and largest ocean liner, launched last year, is driven by reduction gears shaved on Red Ring machines.

And now, nearing completion is a giant shaving machine to finish marine gears 15 feet in diameter to almost incredible tolerances on tooth form, pitch, lead and surface finish. With slight modifications, this unit will handle gears up to 200″ PD.

Power supplies

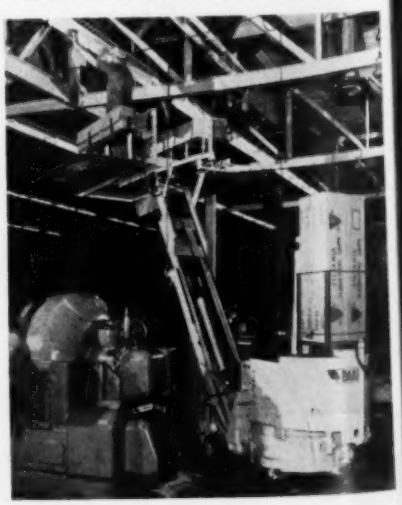
Advances in operating convenience and efficiency are found in a new line of metallic rectifier power supplies for electroplating and anodizing operations. Extensive use of interchangeable standardized components lowers the price of the new equipment over former units. Manually controlled and automatically regulated power supplies, and special equipment for barrel plating and precision laboratory work comprise the line. Maximum operating economy in each rating is achieved by using a variety of circuits and either copper-oxide or selenium rectifier stacks, depending on output desired. *General Electric Co.*

For more data circle No. 28 on postcard, p. 171.

Overhead maintenance

Lift-A-Loft unit eliminates overhead maintenance problems, cuts costs, and reduces to one man the gang often required to make such jobs safe. With the new unit the maintenance man reaches ceiling objectives quickly and safely, with a minimum of disturbance to production workers. One man rides the battery-operated Lift-A-Loft to destination, pushes a button and is up in the air ready to work. Platform is equipped to carry everything he needs. The platform raised is 12 ft 8 in. above the floor; literally making the maintenance man 19 ft tall. *Barrett-Cravens Co.*

For more data circle No. 29 on postcard, p. 171.



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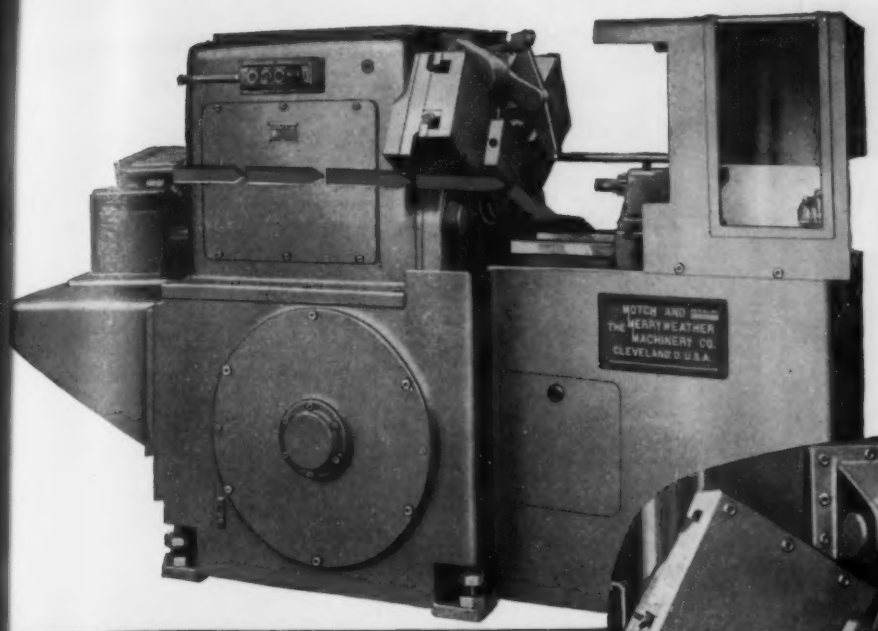
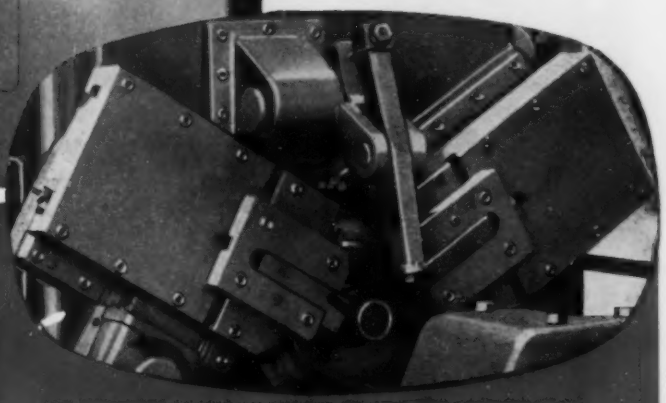


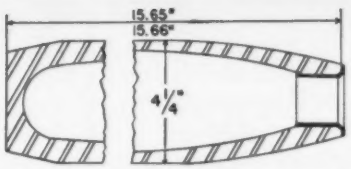
MP/SF
Most Production per Square Foot

Conveyor carries shells to hopper. Shells are fed automatically through hollow spindle, machined and ejected onto conveyor.

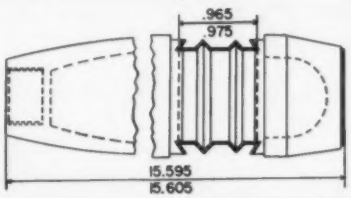


MOTCH & MERRYWEATHER *Automatics* make the most of AUTOMATION

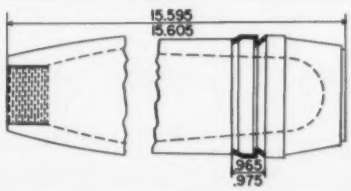
Material: shell steel SAE 1050.
Operation: bore, face, chamfer (nose end)
Estimated Production: 220 pcs/hr. @ 100%.



Material: shell steel SAE 1050.
Operation: face base, turn band groove and band relief.
Estimated Production: 120 pcs/hr. @ 100%.



Material: shell rotating band.
Operation: turn band.
Estimated Production: 220 pcs/hr. @ 100%.



This single-spindle, form-turning automatic, developed for civilian production, has been assigned to much heavy duty munition work. Loading, positioning and unloading are completely automatic. All functions are actuated by hardened cams. With operator fatigue eliminated, one man can service several machines.

Manufactured by — THE MOTCH & MERRYWEATHER MACHINERY CO. —
CLEVELAND 13, OHIO
Builders of ***Circular Sawing Equipment, Production Milling, Turning and Special Machines***

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

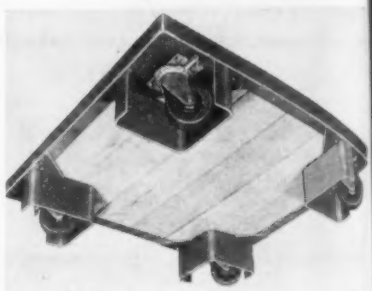
—New Equipment—

Continued

Trailer tractor

New Grip-All tractor has an electric - hydraulic clamp designed to grip all types of trailers and hitches. Clamping and release mechanism is completely hydraulic. The lower toothed clamp can be adjusted in or out depending on the position and height of the container or hitch, upper clamp comes down and the grip is completed. The tractor is made with either a 12 or 18 v battery. Overall dimensions are 27 in. wide x 48 in. long. Draw bar pull is 700 lb. Heavy duty power drive unit and roller grip controls are standard. *Moto-Truc Co.*

For more data circle No. 30 on postcard, p. 171.

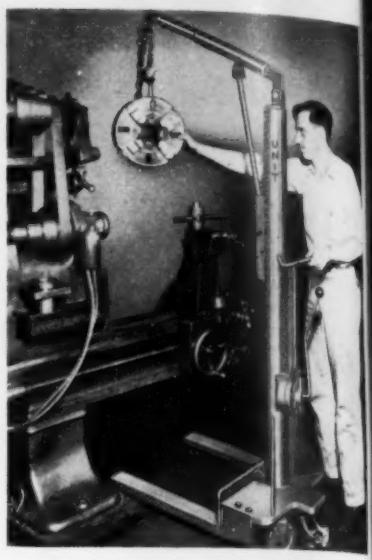


Shielded casters

Heavy - duty dolly is fitted with guards to protect the casters when the dolly is lifted by a fork truck. Swivel type casters are fitted with plungers that can be engaged to lock casters at a fixed position. Aluminum - magnesium construction provides lightweight unit that is easy to move and carry. The platform has magnesium, aluminum or hardwood surface. *Crescent Metal Products, Inc.*

For more data circle No. 31 on postcard, p. 171.

Turn Page



Hydraulic truck

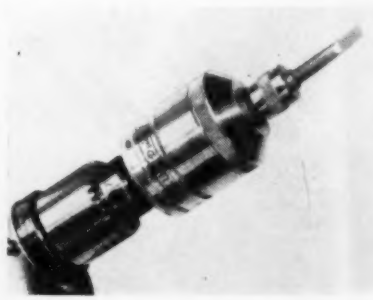
The 3-in-1 shop truck is hydraulically operated, handles lifting jobs within its capacity whether they require boom, forks or platform. The boom makes possible lifting to 8 ft. The switch of one pin puts the forks into operation. Forks need 3¼ in. clearance and will lift pallets to 55 in. To lift non-palletized loads, a platform is locked over the forks. Loads of 750 lb are eased up by the one hand operation of a 5000 lb hydraulic system. *Unit Mfg. Co.*

For more data circle No. 32 on postcard, p. 171.

Impact power drive

New Dril-O-Driver converts all electric drills into speedy impact screw drivers. Cone drive construction of the unit permits the operator to control force and speed from zero to full speed of the electric drill. Fifty-four ¼-in. drive standard tool accessories are on the market for use with drill and Dril-O-Driver. *Drilo Corp.*

For more data circle No. 33 on postcard, p. 171.



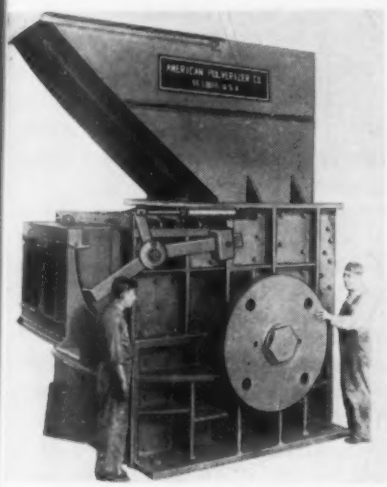
Color code paint

Speedy identification marking of all kinds of metal, wood or other materials, stocks and parts is simplified by Crown color code paint. Packaged in spray type, 12-oz can, the paint is applied in a fine mist that dries dust-free in 5 to 10 min and tack free in 15 to 20 min. It is full-bodied to resist running and adheres firmly, even to dirty or semi-greasy surfaces. Requires minimum surface preparation; resists rubbing off and weathering. Available in 12 fast opaque colors. *Crown Industrial Products Co.*

For more data circle No. 34 on postcard, p. 171.

Metal turnings crusher

For large scale operations in industrial plants, aluminum smelters, and metal recovery yards, a new heavy-duty crusher can reduce metal turnings, aluminum castings, such as crankcases, pistons, pots and pans, and other forms of scrap at a rate of 35 to 50 tons per hour. The crusher uses the original American rolling ring principle: tremendous kinetic and centrifugal forces are exerted on the turnings



or castings by the massive manganese steel shredder rings. The rings deflect and pass over the heavy tramp metal without damage to the crusher. Because rings roll, wear is distributed over all the cutting edges. Rings are reversible for longer life. Construction of the rotor distributes wear evenly across the width of the machine. *American Pulverizer Co.*

For more data circle No. 35 on postcard, p. 171.

Turn Page

Production tool

This handy hoister fills the demand for a light, easily movable stacker or production tool for one-man handling of 500 and 1000-lb loads. The 5-ft lifting unit becomes the tool of a thousand uses: placing dies in presses, quick loading drums, cases, crates on trucks, repair work on machines, depositing work on presses. For specialized handling the lifting platform can be replaced by lifting arms, cradle type platform, roller platform, or forks of required shape and length. A planetary gear winch for lifting and lowering assures precise, trouble-free performance. *Lewis-Shepard.*

For more data circle No. 36 on postcard, p. 171.

Power-impact tools

A complete line of power-impact sockets, extensions, adapters and drivers can be used with any standard air or electrically powered tools. They are designed for use with all standard nut sizes from 3/16 to 3½ in. to meet a wide range of industrial applications. Developed for maximum wear resistance and long life, these tools are manufactured from solid bars of chrome molybdenum steel, hot broached and heat treated for proper hardness to withstand the shock and strain generated by impact guns. They are machined to tolerances established by S.A.E. and A.S.A. standard nut and bolt sections. *Cornwell Quality Tools Co.*

For more data circle No. 37 on postcard, p. 171.

The Iron Age

SALUTES

Morris B. Pendleton

His hobby is bringing ailing enterprises to black ink health by his outstanding executive skills.

THIRTY-FIVE years ago, Morris B. Pendleton went to work as a helper in the forge shop of a Los Angeles tool company his father had helped found a decade earlier.

Today, "Morrie" is president of the concern, now the Plomb Tool Co. of Los Angeles. What started as a three-man blacksmith operation in 1907 has become, under his leadership, one of the nation's top producers of mechanical hand service tools, with four U. S. plants and one Canadian.

The statistics are only a small part of the story. He is 52 years old. He joined Plomb Tool in 1918 and became its vice-president 10 years later and president in 1937. But he also is a director of six other companies, a partner in three more and an officer or director of a dozen business and civic groups.

Other executives take up golf, or bridge or boating as a hobby; he doctors ailing enterprises. For years he has given his time, talents and money to scores of businesses from a Negro cemetery to an orange juice extracting firm. All were in the red when he offered to help—and all are on a paying basis now.

In recognition, the people and companies aided by Pendleton recently established a Pendleton Foundation for Economics at Pomona College to help deserving students and foster economics projects.

A native Californian, he lives with his wife and daughter in San Marino, a suburb of Los Angeles. The Pendletons also have a married son.

The Iron Age

INTRODUCES

J. T. Ryan, Jr., elected president, MINE SAFETY APPLIANCES CO., Pittsburgh.

John S. Dawson, named a vice-president, BRIDGEPORT BRASS CO., Bridgeport, Conn.

Myran J. Livingston, elected a vice-president, ARTHUR G. McKEE & CO., CLEVELAND.

Howard D. Neal, newly appointed vice-president and general manager, AEROL CO., Los Angeles.

F. G. Koenig, Jr., elected vice-president, ALABAMA BY-PRODUCTS CO., Birmingham; **J. E. Johnson,** elected treasurer; and **W. K. Clements,** named assistant treasurer.

Allerton Miller, named vice-president, TEXAS GAS TRANSMISSION CORP., Owensboro, Ky., and **Everett O. Stoothoff,** promoted to secretary.

Edward J. Horkey, becomes vice-president in charge of engineering, PASTUSHIN AVIATION CORP., Los Angeles.

Dr. Wendell R. Mullison, appointed assistant technical director, Dow Chemical International Ltd., and Dow Chemical Inter-American Ltd., subsidiaries of THE DOW CHEMICAL CO.

D. T. Fisher, elected controller. CONSOLIDATED VULTEE AIRCRAFT CORP., San Diego Calif.; and **G. T. Bovee,** elected treasurer.

Edmond E. Lincoln, elected a director, THE CLEVELAND-CLIFFS IRON CO.

Ira Guilden, elected a member of the board, of THE MIDVALE CO.

Rodney C. Gott, and **Murray McConnel,** elected members of the board of directors, AMERICAN MACHINE & FOUNDRY CO.

George S. Dively, elected a member of the board, THE WARNER & SWASEY CO., Cleveland.

James Gerity, Jr., elected a member of the board, SCHULTZ DIE CASTING CO., Toledo.

Samuel G. Harris, named district engineer, Tullahoma, Tenn., for the Aeronautical & Special Products Div., HAGAN CORP.

Fred Hermann, promoted to Refrigeration application engineer, Environmental Test Chamber Div., TENNEY ENGINEERING, INC., Newark.

William H. Meyer, becomes metallurgical sales engineer, GREEN RIVER STEEL CORP., Owensboro, Ky.; and **Vincent Burger,** named sales representative.

Clifford B. Lewis, Jr., promoted to chief inspector, TEMCO AIRCRAFT CORP., Dallas; **Carl Bentley,** becomes a chief inspector; and **Henry C. Neff,** named a chief inspector also.

Wayne S. McDaniel, appointed chief engineer, Eastern District, THE H. K. FERGUSON CO., Cleveland.

Frank R. Kohnstamm, appointed chief engineer, JACK & HEINTZ, INC., Cleveland.

Frank W. Nitterhouse, Jr., named superintendent, Masonary Dept., Middletown Div., ARMCO STEEL CORP.

H. E. Johnston, appointed manager, New York office, DEARBORN CHEMICAL CO.

M. S. George, becomes manager of sales, Railroad Div., INLAND STEEL CO., Chicago; **Harold J. Kreher,** becomes manager of sales, Pig Iron & Coal Chemical Div.; **Roger S. Bullard,** named assistant manager of sales; and **Harry R. Johnson,** becomes manager, New York sales office.

JUDSON C. TRAVIS, elected president, Handy & Harman, New York.

THOMAS D. CARTLEDGE, elected vice-president, Union Carbide & Carbon Corp., New York.

PRESTON C. MITCHELL, elected vice-president, Harbison-Walker Refractories.

A. S. Kromer, named manager, Decatur, Ala. plant, CALUMET & HECLA, INC., Wolverine Tube Div.; **Russell M. Frink**, named director of operations; and **Vincent A. Zatell**, becomes Detroit plant manager.

Robert J. Steele, appointed general superintendent, Carbide Div., FIRTH STERLING INC.; and **John D. Knox**, becomes superintendent, Powdered Metals Div.

Robert E. Walker, becomes manager, Minneapolis office, INTERSTATE STEEL CO., and **Irvin G. Conn**, becomes manager, Des Moines office.

Richard S. Van Note, appointed manager, Chicago office, SELAS CORP., Philadelphia.

J. William Robinson, appointed manager, new Canadian branch, Montreal, THE F. J. STOKES MACHINE CO.

George P. Page, appointed southern sales manager, TAYLOR-WHARTON IRON & STEEL CO.

Paul I. Davis, appointed Cincinnati district sales manager, SHARON STEEL CORP., Sharon, Pa.

Franklin P. Hinman, promoted to product manager, Electronic Tube Div., Elmira, N. Y., WESTINGHOUSE ELECTRIC CORP.; and **W. Allen Brecht**, appointed consulting engineer, Atomic Power Div.

Patrick J. Urso, appointed manager, Fabricating Div., ALLIED METALS CO., Niles, Ohio, **Morris Friedman**, promoted to assistant general manager.

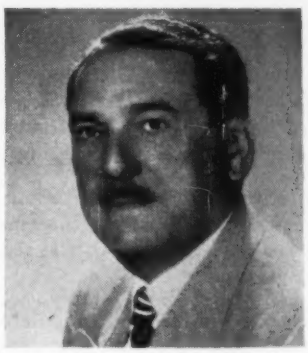
Philip J. Berg, appointed supervisor of sales, Detroit office, DRAVO CORP., Machinery Div.

M. R. Bates, appointed sales engineer, ALLOY PRECISION CASTINGS CO., Cleveland.

Wray Kephart, appointed division purchasing agent, GAR WOOD INDUSTRIES, INC., Wayne Div., Wayne, Mich.; and **D. J. Byrd**, appointed division assistant sales manager.

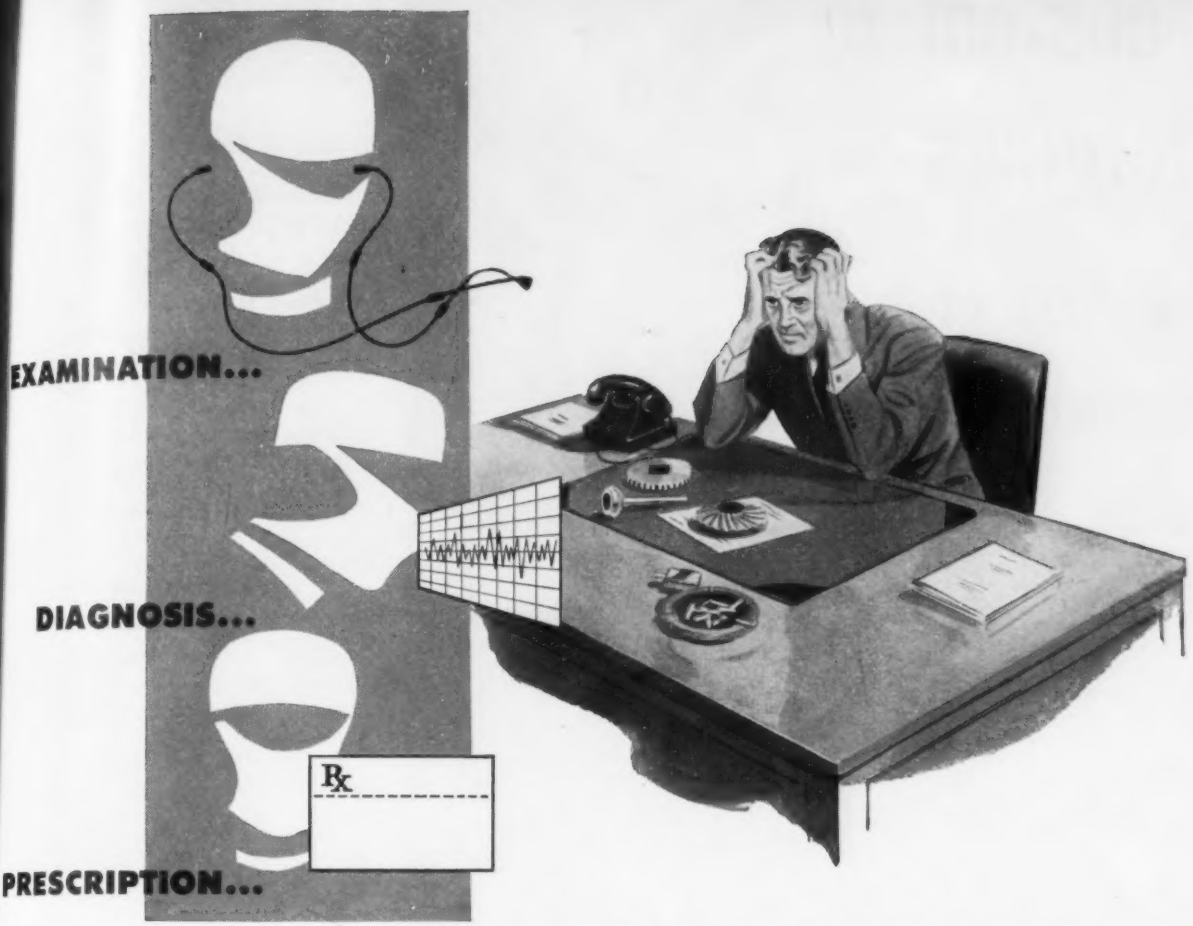
ROBERT S. SWEENEY, becomes divisional vice-president, American Machine & Foundry Co.

WILLIAM M. BAUSCH, appointed assistant vice-president—Mill Sales, Follansbee Steel Corp.



J. B. RIBAKOFF, named a vice-president, Solar Steel Corp., Worcester.

JAMES C. HICKS, appointed director of refractory research, Kaiser Aluminum Chemical Corp.



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—Personnel—

Continued

Jack H. Eisaman, appointed sales and service representative, International Graphite & Electrode Div., SPEER CARBON CO., St. Marys, Pa.

William K. Sticksel, becomes sales representative, Chicago, Metal Industry Dept., THE DIVERSEY CORP.

Evan J. Evans, becomes metallurgical engineer, AMGEAR CORP., subsidiary of Hupp Corp., Chicago.

Robert F. Lotz, appointed manager, Ardmore, Pa., office of ERICKSON TOOL CO., Cleveland.

OBITUARIES

Oscar C. Schmitt, 59, president and director, The Emerson Electric Mfg. Co., St. Louis of a heart attack.

Austin E. Anderson, president, Anderson Milker Co., Inc., Jamestown, N. Y.

Archie H. Anderson, vice-president, Anderson Milker Co., Inc., Jamestown, N. Y.

Harry M. Carroll, 60, advertising manager, Hyatt Bearings Div., General Motors Corp., Harrison, N. J., in East Orange, N. J., General Hospital after a short illness.

Clarence E. Abbott, Sr., former vice-president, Tennessee Coal & Iron & Railroad Co., Birmingham, recently in Raleigh, N. C.

E. E. McInnis, 70, retired vice-president and general counsel, Santa Fe Railway, at his home in Atherton, Calif., after a long illness.

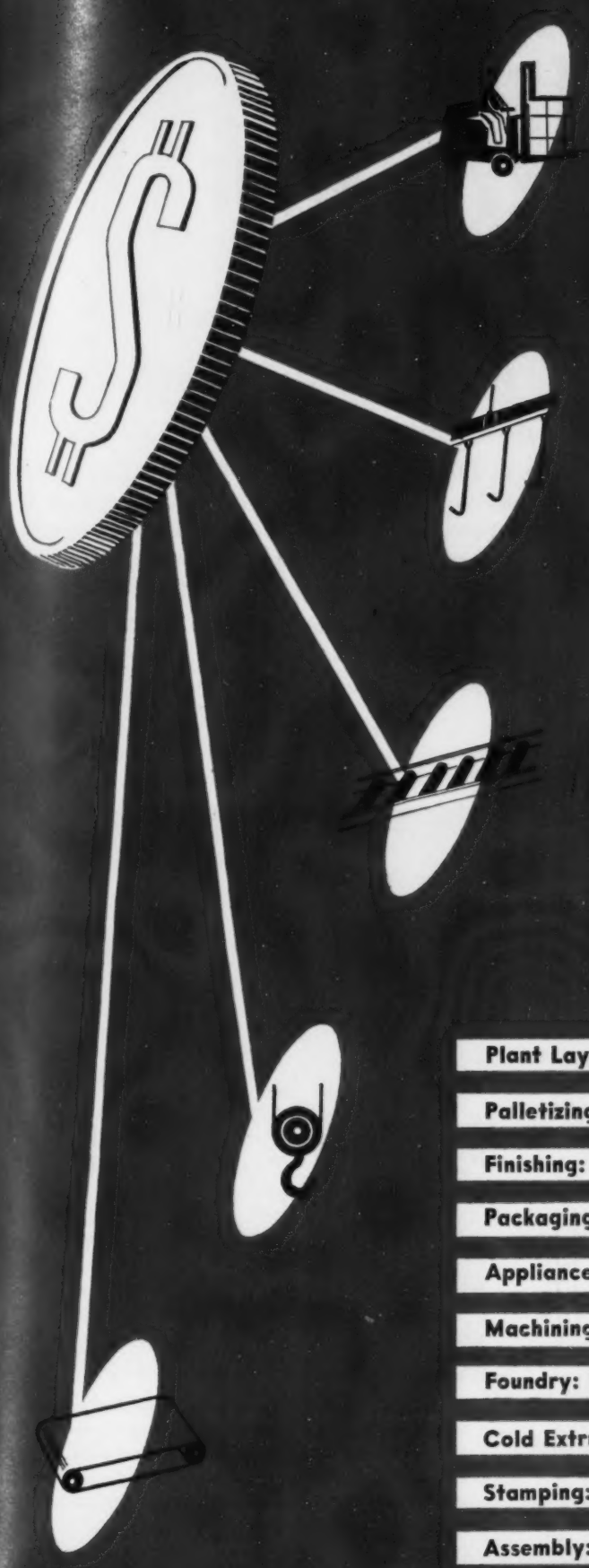
Robert Ehrlich, 65, treasurer, Moses Ehrlich Iron & Metal Co., Springfield, Mass., and treasurer of the West Springfield Warehouse Co., recently in Springfield, Mass.

Colin L. Stokes, 64, superintendent, Mechanical & Electrical Dept., South San Francisco Plant, Bethlehem Pacific Coast Steel Corp.

Robert Miller Schrader, 55, general manager of purchases, Continental Can Co., Inc., New York, recently, at his home.

William C. Royal, 48, Cleveland representative, Selas Corp. of America., suddenly of a heart attack.

The Iron Age
FOUNDED 1855
Materials Handling Issue



profit or loss depends on good MATERIALS HANDLING

Plant Layout: Basic Factor in Handling	P. 200
Palletizing: Cut Costs Permanently	P. 205
Finishing: Group Parts In Painting	P. 208
Packaging: Machine Wraps Bumpers	P. 210
Appliances: Broad View In Handling	P. 212
Machining: Parts Flow vs. Machine Time	P. 218
Foundry: Hard Labor Commuted	P. 222
Cold Extrusion: Conveyers Lift Output	P. 225
Stamping: Cut Costs with Automation	P. 232
Assembly: Machines are Better, Faster	P. 236

An industrial murder—

The Case of the CROSS-EYED WAIF

—A study in plant layout—

By H. H. Dasey
President
Visual Planning Equipment Co.
Oakmont, Pa.

- Materials handling—the movement of raw materials, parts, sub-assemblies and finished products—creates the greatest single problem in plant layout.
- Poor layout can often kill the best-conceived materials handling ideas or the most carefully thought-out new plant proposals . . . It is sometimes difficult to catch this culprit in a 2-dimensional plant layout . . . capture becomes more certain when 3-dimensional planning is used.
- In a departure from the usual technical style, the author shows why this new type of plant planning pays off, how costly layout mistakes can be avoided.

◆ ALTHOUGH I am not a professional private eye, my friends know that I enjoy dabbling in industrial murder, larceny and kindred crimes beyond the ken of the civilian police. So I was not particularly surprised when Throckmorton barged into my office the other day, his breath coming in short pants, his face flushed—obviously badly upset.

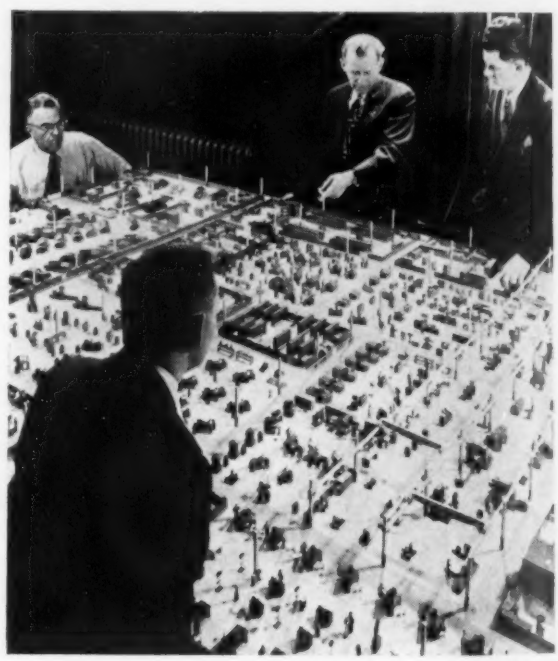
Throckmorton, I knew, had been working as an engineer on plans for an $8 million engine assembly plant. He's with a big company; you'd know the name if I were at liberty to mention it.

"Turned down cold, flat, dead as a mackerel. . . ."

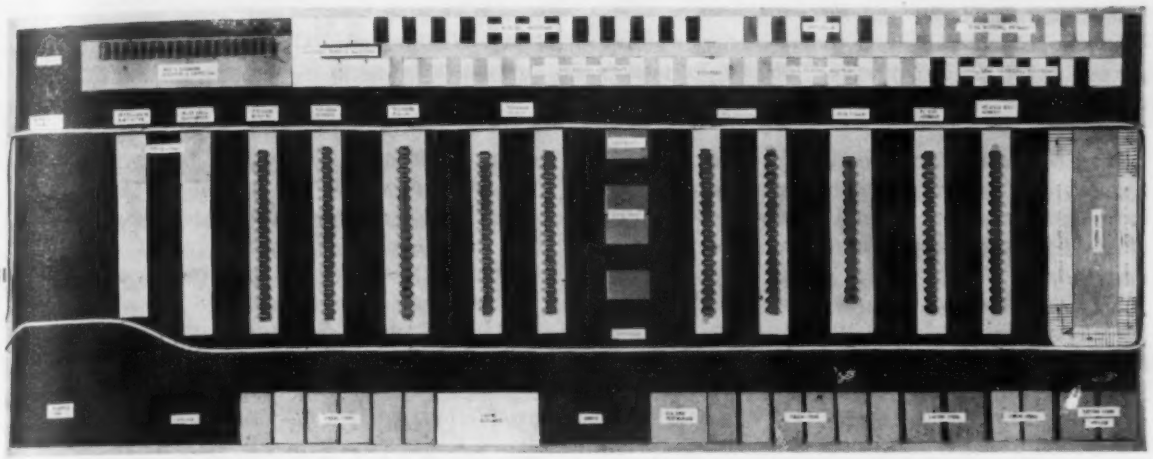
"Just a minute," I cut in, "do you mind starting at the beginning?"

"I thought you knew we'd been working night and day for nearly 2 years on plans for a new engine plant. Well, today Jones and I submitted it to the board of directors; sat there for 8 hours while they cross examined us. They killed it! Hacked away until there was nothing left of it. Claimed it was too radical. Weren't sure it would work. It's murder. . . ."

My girl Saturday was at his elbow when he collapsed; guided him into a chair and began to pick up the sheaf of papers that spilled from his arms. There were a couple of photographs, a



INSURANCE on some $8 million in plant and equipment is this 3-dimensional model which shows every item in the plant, even to building columns, cranes and parking lot. Next step is to spot in location of conveyers, pickup points for pallets, tote boxes and other equipment needed to assure smooth handling.



THE CORPSE — ONLY THE INITIATE may understand this 2-dimensional plant layout—the plant proposal whose death is related in the accompanying report. Note that not even 2-dimensional templates are used to show exact shape and size of the various units of the plan.

ream of stenographic notes of the board meeting.

I didn't even need my lab equipment for this; Throckmorton was coming around now. I swung around at him.

"This job was pulled by our old friend the Cross Eyed Waif, alias Bad Plant Layout, but I'm afraid he had accomplices in the company." Let me reconstruct the scene; to make it simple we'll leave out names and put it in question and answer form:

Q: *How thorough was the preparation of data by engineering and management that determined the size of the new plant, its equipment and operation?*

A: The preparation was handled by a composite group of management, industrial engineers, plant and tool engineers—all top men.

Q. *How long did the study and compiling of the data take?*

A: About 2 years, or 100,000 man hr.

Q: *Roughly, how was that time spent?*

A: It was spent in factually planning a complete manufacturing plant of some 200,000 sq ft to manufacture new motors.

Q: *What type of construction—as to quality—was planned? What quality of materials and equipment?*

A: Only the best.

Q: *To co-ordinate all the information and process the final plant layout, what medium was used as a tool? In other words, what method of plant layout was used as insurance against errors in judgment and engineering mistakes?*

A: Er—well—we made up a layout.

Q: *What do you mean "made up"?*

A: We use a graph sheet pasted on a panel and then cut out to ¼-in. scale pieces of colored and plain paper and cardboard in the shape of the machines and equipment. We place these on the graph, which represents the building area.

Q: *How do you know what each thing that is cut out represents?*

A: We label the template with the name and number of the thing it represents, and put other necessary information on it.

Q: *Does the layout contain every piece of equipment in the plant?*

A: No, only the machines and large equipment.

Q: *Does this then represent an accurate layout of the plant?*

A: It gives us a pretty good idea of where everything big goes; then we can estimate the space needed for other and smaller equipment. Because the engineers and management people concerned with the layout know their business thoroughly, we don't feel it necessary to carry out every minute detail of the template-planned layout.

Q: *Please answer the question. Does this represent an accurate layout of the plant?*

A: No, not exactly.

Q: *Please explain how it is possible to represent the combined engineering and management thinking in a 2-dimensional, or single-plane layout, when buildings, equipment and all the activity that goes on in a manufacturing plant has a height dimension? This height dimension would certainly develop interference and clearance problems, which could not possibly be ascertained from a 2-dimensional layout.*

A: As I said before, the people who were concerned with the planning of this project are experienced men in their fields. When they look at a 2-dimensional template they can visualize the heights, interferences, etc.

Q: *If what you say about technically trained*

people being able to understand this type of 2-dimensional layout is true, what is your opinion of the non-technical persons' ability to understand it if they have had no hand in its preparation?

A: I would say that the layout would not mean a great deal to the non-technical man, and that it would have to be completely analyzed—or translated—before he could understand the problems involved.

Q. *How then can you be sure that the final layout as presented to top management will clearly and exactly represent the proposed plant?*

A: We can't be sure, but it is approximate.

Q. *When you say "approximate," does that mean that changes may have to be made after the plant is built and ready to operate?*

A: Of course, we always have to make changes.

Q: *Why is that?*

A: Because, with so many people and departments working on a new layout, it is hard to record the group thinking. Therefore, because some people don't understand our layout, they hesitate to recommend things when they are consulted.

Sometimes people are fired

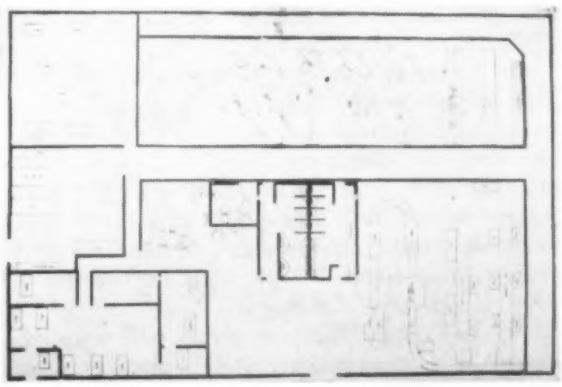
Q: *Are these things important?*

A: Yes. For instance, a good foreman has an intimate knowledge of the workings of his department, but may hesitate to propose changes on a rough layout or even on a detailed drawing because he can't visualize the overall operation.

Q: *Does management ever have changes made for the same reason?*

A: Oh yes. And sometimes people are fired or catch hell because top management did not know what the final layout would be.

Q: *When these changes you speak of are made —does it cost money?*



A 2-DIMENSIONAL LAYOUT made with templates may often be improved upon by transferring it to three dimensions. This 2-dimensional plan is a good clean job . . .

A: Yes, sir!

Q: *How much? Or rather, cite an instance or two.*

A: One time we had to move a large broach with a sub-foundation because of the interference of columns; we couldn't handle the work in the area allowed. That cost about 15 days shutdown time and some $3000. Another time we did not have enough clearance over a machine to carry certain parts of the overhead conveyer. We had to re-lay out the whole line.

Q: *How much did that cost?*

A: I don't know, but a man in accounting said it was around $15,000 and we lost about 20 days production.

Thousands of dollars wasted

Q: *You mean that because of inadequate layout techniques, the planning is not exact nor sufficiently detailed to eliminate later changes. And because of this, thousands of dollars are spent and hundreds of hours are wasted.*

A: That's about it.

Q: *Will you please explain the fact that while every detail of the specifications of the new plant called for the best material, equipment, etc., the overall planning was not done with the proper type of equipment which would have provided an exact method of detailing the complete plant—buildings, equipment and operation — so that everyone would understand the overall project?*

A: Unfortunately, when it comes to planning tools, we, like most engineering departments, are required to make our own; although, as I stated before, there are far better techniques which could have been used to develop the layout.

Q: *Is there one type of technique which you consider the best?*

A: Yes, sir. It's called 3-dimensional planning. The complete layout is made in three dimensions. In other words, models are used instead of templates or drawings.

Q: *You mean the whole plant in models?*

A: Yes, sir. First a floor plan is laid out on Lucite sheets in exact quarter-inch scale. The walls are erected exactly to print, and all doorways are shown in exact position. Then all columns are built into the building and are shown to the proper height to give working ceiling clearances. If it is a multi-story building the floors rest on these columns. All stairways, elevators, overhead cranes, etc., are built in as if the building were full-size, except that the whole thing is exactly scaled to ¼ in. to 1 ft.

Q: *Then this is actually a miniature replica of the plant to be built?*

A: In addition to the Lucite building, every piece of equipment that occupies floor space is used in model form . . . ¼ in. scale models which

are built to the exact dimensions of the full size equipment.

Q: *Just a minute—you mean that a model of each machine is used?*

A: Yes, a model of each machine. But more important than the machines, a model of every piece of plant equipment is used whether it's an overhead conveyer, lockers, office equipment, bins, trucks, tote boxes, skids or pallets.

Q: *Is this so that you know exactly where each piece will be and what it does?*

A: Yes, because, you see, it is not the machines that create important layout problems—they seldom occupy more than 20 pct of the total space in any plant. It is the activity they create in the processing operations they perform.

Q: *What do you mean by that? I always thought the prime layout problem was space for machinery.*

A: No, sir. You see, a machine just sits in one place and chews up material or processes it in a certain way. So, after the machine is located in relation to the job it performs, it ceases to be a layout problem.

It demands something to chew up

Q: *Go on.*

A: Its first demand is for something to chew up or process. Thus a constant supply of material must be continually coming into the plant; it must be unloaded from trucks or railroad cars and transported to storage. Obviously these storage areas must be as close as possible to the machines they feed. Then as these materials move to the various machines they must be inspected. Then they are parceled out in proper quantities to the proper machines at pre-determined rates of flow. This requires an individual method of handling and floor storage at point-of-machine-demand: storage for each of dozens of types of materials. Then, as each successive operation is performed by the various machines, this conglomerate mass of partially processed parts must move to the next operation.

Q: *Is this all necessary to explain a good layout system?*

A: Yes, sir . . . and it is because too often these facts are not considered that we have another industrial murder on our hands.

Q: *Please go on.*

A: Well, as the parts are completed they must be inspected, then transported to the assembly department or to an intermediate storage area from which they can be issued to assembly as needed. Here again we have a tremendous storage and handling problem inasmuch as each part usually has to be handled in a different manner.

Q: *What do you mean "handled"?*

A: I mean that because some are large and some are small, different containers are used. Some may have to be protected because of their delicacy or fine finish; some must be stored under specific atmospheric and temperature conditions before use.

Q: *Go on.*

A: Take a motor for an example. Except for the block, it starts out as hundreds of small pieces, but as the various sub-assemblies are built up, they change in size until they are ready to be assembled into the final motor. Therefore, as these parts are assembled, they increase in bulk, take on new shapes, and then must be handled and transported in many changing ways.

Q: *How does this material transport and storage problem affect plant layout?*

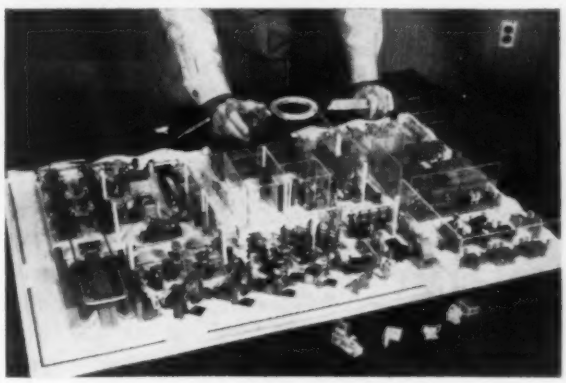
A: The materials handling of the various parts and component assemblies creates the largest single problem in the layout. This is because all types of containers, racks, bins, tables, trucks and conveyers are required to handle these parts and assemblies. This equipment usually takes up a far greater space-percentage than the machines and it is continually on the move. So, in addition to the bulk-handling and carrier problems, it presents the critical problem of traffic or flow.

Q: *Beside the location of machinery and handling of materials, are there other complicated situations which must be completely detailed in planning the plant?*

A: Yes, sir.

Q: *Without getting long-winded, please outline another.*

A: Well, people working in a plant must have space in which to store their clothing when they change to shop clothes; they must have a place to eat; they must have toilet facilities; there must be first-aid or hospital space; and for each person there is a certain amount of record-keeping space required, such as payroll, insurance, etc. Then the traffic of the individual and his



BUT when the same thing was made up in model form, some $12,000 in equipment (the five items in the foreground) was found to be unnecessary.

lines of travel within the plant must be considered as an additional traffic problem.

Q: *You believe, then, that all these things you have outlined are extremely important?*

A: Yes, the average large plant today is so complex that no man or group of men—no matter how expert—can remember or mentally record, translate and properly judge the variables.

Q: *Then you believe that the proper layout technique is the one you described—the 3-dimensional layout?*

A: Yes, sir . . . because, if you have a complete model in exact scale, with every known piece of equipment to be used and an exact layout of the production space or building available, you are dealing with facts, not ideas or guesses. No translations are needed, you don't depend on memory; good ideas and bad ones show up in the planning stage, long before the plant is built or an old plant is reorganized.

No one sold the concrete

Q: *If what you say is true, why was this system of layout not used in the present case?*

A: Well, it's hard to say, but I think management thought it was too expensive. I know that some of our engineers wanted to use a 3-dimensional layout, but we didn't seem to be able to sell the idea.

Q: *Why do you say "sell the idea"? Is this only an idea, or is it a proved system?*

A: Oh, it's a fact, a proved idea, all right. Some of the largest companies are using it with great success. But we say "sell the idea" because management doesn't seem to know much about it.

Q: *Did you have to "sell the idea" of using concrete for the foundation?*

A: No, sir. Ha, Ha.

Q: *Did you have to "sell the idea" of buying specific machines for specific operations?*

A: No, sir. But we did have to prove we could turn out more engines and engine parts, etc., with the proper machines before we could get the money for them.

Q. *Then did you also try to prove the need and demonstrate the values of 3-dimensional planning?*

A: Well, I guess we did not present the picture well enough to justify the cost—but we sure could now!

Q: *Why "now"?*

A: Because now, after it is all over, we could demonstrate the values of proper planning layouts on the basis that we would have saved thousands of man-hours of planning time and would have been able to factually present the true value of all the excellent engineering and management thinking that went into the plans for the proposed plant.

Instead, we've helped commit a sort of murder —unintentionally destroyed something of great value because we did not explain it properly . . . could not because it "cost too much."

Q: *What was this serious cost obstacle? How much would it have cost to have used the proper type of layout equipment?*

A: To do the important part of the plant—those sections dealing with the most important production and material-handling problems—would have cost about $9000.

Q: *How much would the complete job have cost? That is, the whole plant exactly to scale and containing every piece of equipment.*

For $8 million spend $12,000

A: About $12,000 complete.

Q: *In short then, for $12,000 you could have done a complete job of laying out every function that would have determined and controlled the expenditure of $8 million?*

A: Yes, sir. And as long as I've gone this far—I'll admit we spent about three times that much doing it with cut-outs and boards and tape, and then failed to get the approval to build it.

Q: *Is this equipment readily available—this 3-dimensional planning system?*

A: Yes. At the time we got the quotation on the cost of the layout, the manufacturer of that equipment said he could deliver us the complete plant in about 40 days.

The brains were wasted

Q: *Do you feel then that engineering was penalized in this case because instead of devoting their highly trained minds to the solutions involved in the overall planning of the plant, they were required to spend months of their time in what amounts to making their own tools before they could go to work?*

A: Yes, sir.

Q: *Do you have anything further to say?*

A: Only that having participated for some 2 years in this whole project and knowing the fine quality of the engineering minds and management thinking that directed the planning, I feel that the failure to secure approval for the new plant from the board of directors was not wholly the fault of the men who developed the project.

I feel that it was the lack of a proper planning technique through which we could make the engineering and management ideas known. I'll confess that the failure to sell the project to the board of directors was due to an ill-conceived and antiquated method of presentation of the group-thinking. Therefore, because the board members are mostly non-technical people, they failed to understand the whole thing.

How to Save on Pallets

By Don W. Kelsey, District Manager, Union Steel Products Co., Albion, Mich.

Care of products is first objective . . .

About 50 pct of materials shipped abroad to U. S. armed forces in early stages of World War II were unusable on arrival. Redesigned packaging and use of metal containers solved this problem.

From 36 to 39 pct of manufacturer's cost in a high-production setup is for materials handling . . .

Estimated savings by efficient handling in metal containers by a major car producer are $90 to $100 per car. Savings of $50 per car are common in the auto industry. Comparable savings by smaller manufacturers are possible if the system is analyzed correctly and equipment is engineered for efficiency. Many engineers believe materials handling offers the greatest potential for cost cutting in industry.

Steel containers replace about twice as many wood pallets . . .

A prominent auto company bought 4200 wire containers to replace 7000 wood pallets. After 5 years, 3623 metal containers were still in service. During this period, maintenance costs were only a fraction of those for keeping the wood pallets in service.

High initial cost is often offset by low overall cost . . .

An initial cost of $13,000 paid by a Detroit firm for wooden pallets grew to $140,000 by the end of 5 years as a result of maintenance and replacement expenses. Steel containers, costing three times as much initially, would have resulted in lower overall cost.

Sound engineering is best answer to most problems in handling of materials . . .

A well-known Michigan company, using a trailer truck system throughout the plant, decided to use permanent pallets. By redesigning the trailers, platforms were eliminated and pallets became the floor, saving $23 in the cost of each trailer. Fork trucks now lift all materials, completely eliminating injuries due to manual lifting.

Insurance saving may pay for extra cost of steel pallets . . .

Regulations in an industrial area allowed only 5 pct of storage area for flammable materials without an insurance penalty. A change to new wire pallets was made, cost of which was absorbed in 2 years by lower insurance premiums.

Good engineering can save substantially on handling costs . . .

A small manufacturer of metal tubing products re-engineered his materials handling system for full use of pallets. The new layout, using roller conveyers and strong metal pallets, handles materials faster, more efficiently, at substantially lower cost and has doubled available floor space.

Over-design is as bad as under-design . . .

Analysis by one firm showed a container to weigh more than the load it carried. Redesigned containers now carry loads safely and save 200 lb of weight per container.

Packaging goods for national defense is a challenge to good engineers . . .

Early in World War II, tank turret rings were wrapped individually and packaged in wooden boxes to prevent damage and distortion in shipment. Movement of 0.050 in. was enough to affect serviceability. Redesigned racks which can be handled by all types of overhead equipment now carry ten turret rings at a time and hold distortion to within 0.005 in. Saving in packaging cost is $16 per ring.

Automatic Assembly of Small Parts Saves Money

By W. G. Patton
Asst. Technical Editor

◆ Operating at 28 strokes per min, machine assembles small parts faster and better than by hand . . . Six-station index table is fed small parts through a hopper . . . Ejection is automatic.

◆ Machine threads in an insert, presses and stakes, feeds and drives screw and locks in assembly . . . Lowers cost and requires less floor space.

◆ STEADILY EXPANDING postwar demand for telephones of uniform high quality caused Western Electric Co., Indianapolis, to install recently an automatic dial-type indexing machine. This machine assembles a threaded insert to an aluminum stamping, drives a hex-head machine screw into the insert and upsets the last thread of the screw to prevent backing out of the screw without the aid of tools.

The new machine ejects the completed subassembly by compressed air into a bin conveniently located adjacent to the operator performing the subsequent operation. The machine operates at 28 strokes per min although it is adjustable to operate at any speed from 16 to 32 strokes per min.

Assembly is accomplished on an automatic 6-station indexing table 14½ in. in diam. The sequence of operations at each of the stations is shown at the right.

No handling of the parts is required except to place the stamping in position over two steel pins at loading station No. 2 in front of the machine.

The threaded insert and the screw are fed as required by two power screwdriver hopper units. A standard power screwdriver drives the screw automatically. In the final operation, the end thread of the screw is upset to prevent the screw from being backed off or from falling out due to vibration during the following operations or in transit of the apparatus.

The automatic assembly of the part on this machine offers the following advantages over a manual sequence of operations:

(1) Small parts are hopper fed and do not require handling by operator (except placing the stamping in position and loading the automatic feed hoppers).

(2) Three separate operations are combined and

STATION NO.	OPERATION
1	Feed threaded insert into nesting detail.
2	Operator places stamping on two locating and holding pins.
3	Idle.
4	Press and ring stake stamping over threaded insert.
5	Feed and drive screw into insert.
6	Deform bottom thread of screw.

Part is air ejected between stations 6 and 1.

performed in the automatic assembly machine.

(3) Lower cost due to greater output per labor hour.

(4) Substantially less floor space required.

The index table is powered by a ¼-hp motor and driven by a positive-locking Geneva motion, running in an oil bath. The index table has a built-in trip rod which actuates a valve control unit. All timing is controlled from the trip rod which is operated by a cam on the Geneva spindle. Working heads and feed hoppers are mounted on the flat machine surface of the index table.

Feeding of the threaded insert and screw is accomplished by two 12-in. standard rotary hopper units and associated chutes. The small insert is gravity fed by means of the chute into a nesting detail and the aluminum stamping is placed over two hardened steel pins which locates and holds the stamping during the pressing and ring-staking operation.

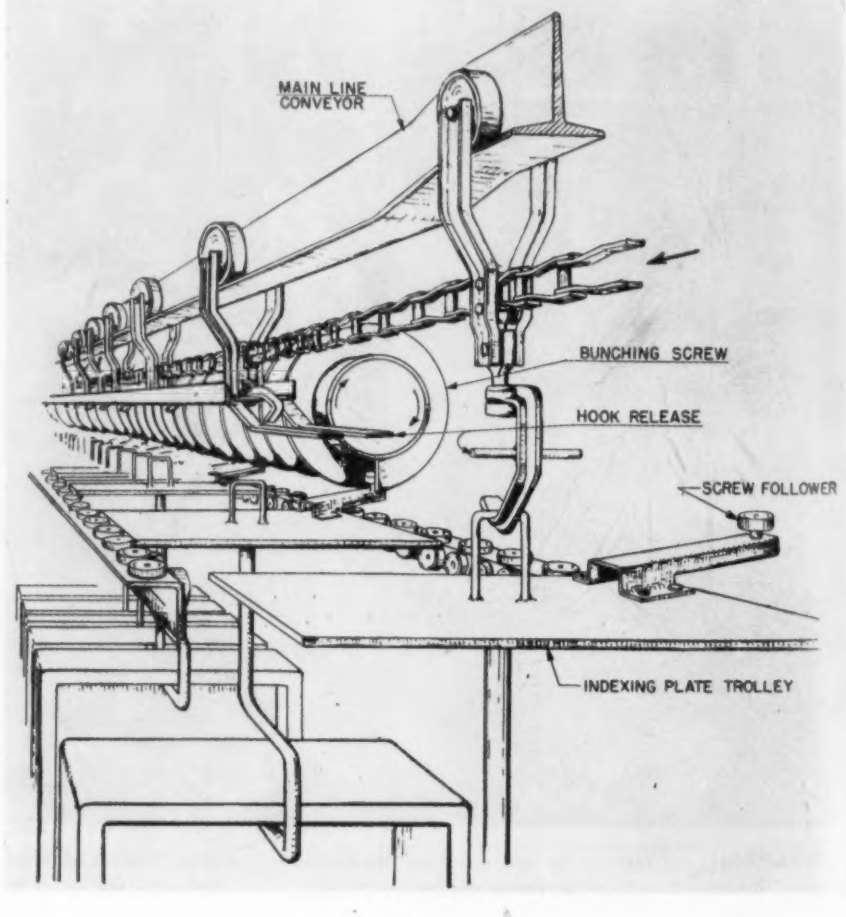
STAMPINGS are located on fixture by two hardened pins. Operator hangs part on fixture and presses starting button. The machine does the rest including automatic ejection by use of air blast.

SCREW MECHANISM Groups Cabinets for Better Finishes

◆ Close spacing of washer cabinets by a grouping unit in an electro-spray system provides more uniform paint coverage . . . Rejects have been reduced to 1 pct.

◆ Each gallon of paint coats 175 pct more cabinets . . . painting efficiency has been increased to 99 pct.

◆ Unit is based on screw-conveyer principle . . . Other advantages are: less maintenance, higher production and lower air makeup cost.



TRANSFER POINT where washer cabinets are disengaged from main conveyer and re-spaced by a grouping unit. Normal work spacing of 22 in. is reduced to 5 in. to provide for more uniform electro-sprayed coatings. The unit also transfers the cabinets back to the main conveyer after they have been sprayed.

♦ SPACING OF OBJECTS to be painted by the electrostatic spray-painting method has an important bearing on the quality of their finish. The closer the spacing, the better the finish. Unfortunately, large rectangular objects hung closely together on a conveyer will not turn corners and move uphill and downhill without bumping. Damage to the finish due to improper spacing can be troublesome and costly.

A grouping unit, used in conjunction with a main conveyer, solves this problem at the Whirlpool Corp., St. Joseph, Mich. Because the 22-in. spacing on the main conveyer is too great, cabinets are transferred automatically to a grouping unit with a 5-in. spacing while they pass through the spray station.

Unpainted cabinets, spaced 22 in. apart, are delivered to the paint booth by the main conveyer traveling at a speed of 18.5 fpm. At the entrance to the spray booth, the conveyer hook is disengaged automatically from the work holder. A plate member at the top of the work holder slides onto a supporting structure f parallel rails below the main conveyer.

A screw follower on the work holder engages a special rotating screw which propels the holder along the parallel slide rails. Varying pitch of the screw provides the desired speed changes. Faster forward movement is accomplished smoothly with this arrangement.

The greater pitch at the start of the screw moves parts faster than they moved along the main conveyer line. This forward speed leaves the conveyer hook behind so it can be disengaged. As the parts progress, the screw pitch decreases, reducing the speed to 12.4 fpm for painting. A worm with constant pitch then carries the parts past the atomizing heads at uniform speed.

After parts pass the electrostatic zone, travel speed increases to 18.5 fpm. The transfer back to the main conveyer is accomplished just as simply. When the part reaches the main conveyer, a hook re-engages the work holder. No manual handling is required. Conveyer hooks have sufficient height so that they can swing back to the vertical position.

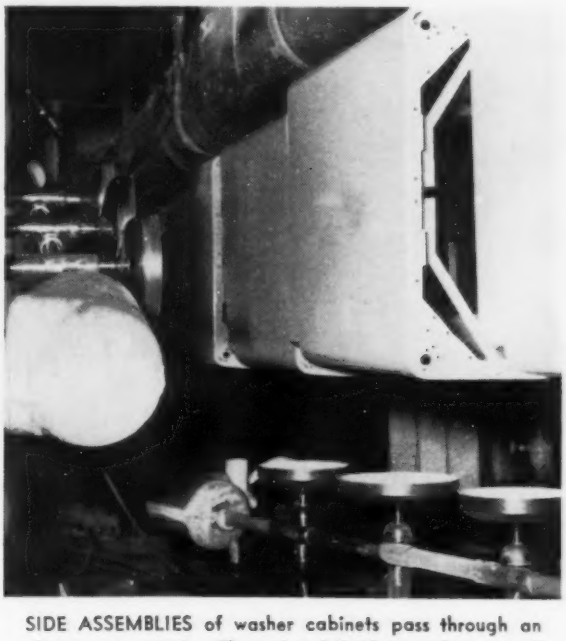
Any reasonable speed range is possible with the screw unit merely by changing gears. Screw speed is determined by the desired spacing between parts in the spray zone. This is synchronized by a direct drive from the main conveyer.

If desired, a cabinet can be turned 90° by means of a small stationary pin which engages a channel-shaped arm on the work holder plate, causing it to turn on the rollers. While making the turn, the work is moved forward by a small auxiliary chain conveyer.

The Ransburg electro-spray process not only gives more uniform coverage than that obtained by former hand-spray methods, but repaint jobs have been reduced 75 pct. Less than 1 pct rejects now result from defective painting and painting efficiency is up to 99 pct.

Formerly, 1 gal of paint covered eight washing machine cabinets. With electrostatic spraying, 1 gal paints 22 cabinets. In addition, labor and maintenance costs are lower.

SCREW CONVEYER carries washer assemblies through an electrostatic spray-painting unit at speed of 12.4 fpm. After spraying, they are transferred automatically to main conveyer moving at 18.5 fpm



SIDE ASSEMBLIES of washer cabinets pass through an electro-spray station The painted finish is uniform on all sides. Painting efficiency with this system is 99 pct and rejects are only 1 pct.

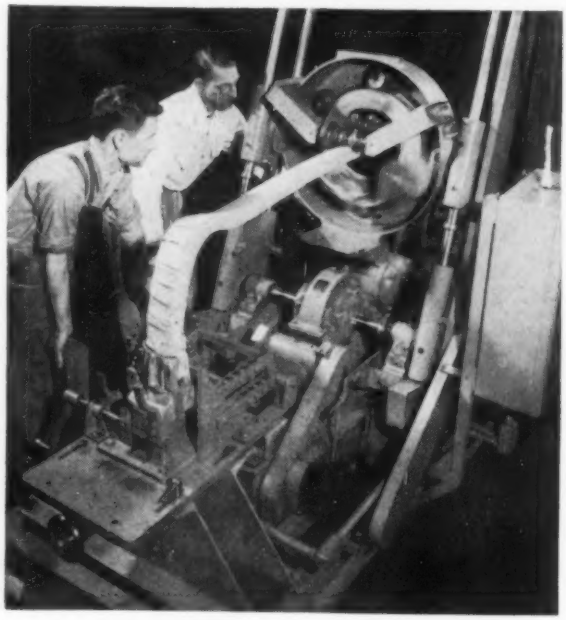
Bumper-Wrapping Machine CUTS PACKING, SHIPPING COSTS

◆ Specially-designed machine wraps an awkward-to-handle car bumper in a few seconds . . . New principle saves 40 pct over former method . . . It accommodates change in bumper design.

◆ MATERIALS-HANDLING ENGINEERS in the automobile industry used to say jokingly that if they could wrap a car bumper automatically, they could package anything automatically.

This isn't a joke any more—it's an accomplished fact. A special machine built by Angier Corp. actually wraps bumpers automatically at the Pontiac parts depot.

Bumpers now received by Pontiac dealers are spotlessly clean, with no messy grease or loose wrappings. The machine is a self-liquidating investment that assures Pontiac car owners better, more efficient parts service. Savings compared with the old carton packaging method are 40 pct. Compared with hand wrapping, savings are 19 pct.



BUMPER-WRAPPING MACHINE reverses the method used for wrapping tires. Shuttle travels over the object to complete the job in a few seconds. It is more efficient than the previous method of packaging bumpers in cartons and has cut costs more than 40 pct.

Bumpers are awkward to handle, yet they must be protected against marring and scratching. A company like Pontiac, which has placed more than 2½ million cars on the highways, is called upon to ship more than 100,000 bumpers annually.

Pontiac used to package its service bumpers in cartons. Production was slow, costs were high and much floor space was needed.

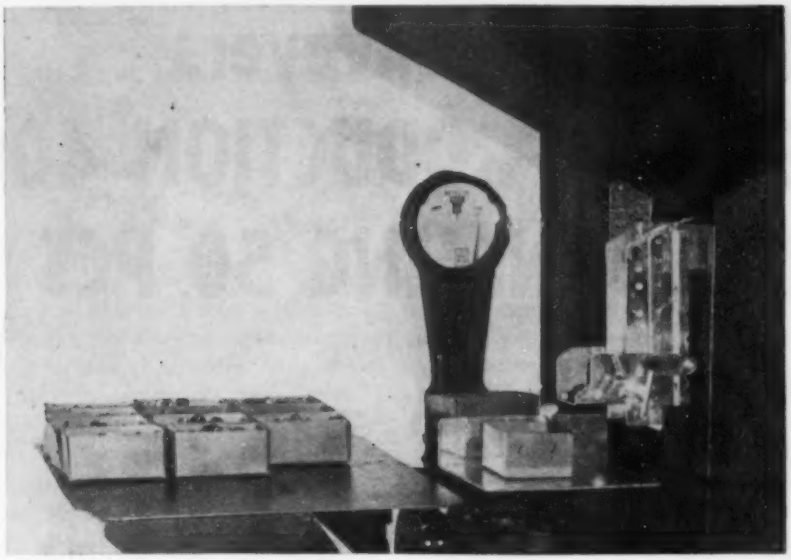
The previous packing method amply protected the bumpers but it was not the best protection. Recent tests show that spiral-wrapped bumpers can be dragged across a concrete floor without damage from scuffing although the company does not recommend this as a materials-handling method.

Pontiac materials-handling engineers together with engineers from the Angier Corp., Framingham, Mass., designed and engineered the Travelwrap machine which solved the bumper wrapping and shipping problem. Previous experience from spiral-wrapping machines for automobile tires and wire coils undoubtedly helped, but an entirely new wrapping method had to be developed to solve this problem.

The old method of wrapping tires passed the object to be wrapped through a fixed-shuttle location. Angier reversed this process for wrapping bumpers by traveling the shuttle over the object.

Travelwrap wraps a bumper in a matter of seconds with special custom-made waterproof paper. Wrapping costs have been cut sharply.

The machine is adjustable to accommodate changes in bumper design. The machine now wraps both front and rear bumpers although the designs are not identical.



WEIGHING MACHINE counts and packs small parts semi-automatically, reducing operator's work by more than 99 pct. It doubles production, cuts costs.

Weighing Machine Reduces MANUAL HANDLING

◆ Quick-adjusting scale automatically stops flow of small parts from feed unit when correct weight is reached . . . Handling rates have been doubled and physical effort reduced 99 pct.

◆ INACCURACY AND DRUDGERY have been taken out of the tedious and costly job of counting and packaging small parts by a new semi-automatic machine built by Inter-Lakes Engineering Co., Detroit. It eliminates more than 99 pct of the physical handling previously required.

Called Weight-O-Pack, the new machine automatically feeds washers, nuts, bolts, eyelets and other small parts into a container. When two or three pieces short of the required amount of material are in the package, the scale de-energizes the vibrating feed unit, stopping the flow of parts. The operator then drops in two or three additional pieces to complete the count. Weight of the package can be quickly checked by glancing at the scale.

The new, relatively low-cost machine eliminates manual handling of tons of material each day. Production rates in several plants have been doubled—while physical effort and costly inspection have been minimized.

To set the machine for any particular count or weight, a container with the required number of parts is placed on the balancing plate. A screw on the side of the machine permits quick adjustment of the limit switch. Hand or foot-control starting and stopping buttons may be used.

An adjustable hopper trough accommodates various package sizes. It can be unhooked and the opening reduced or enlarged to match the package size.

The standard machine occupies a space 38 x 25 in. and is 6 ft high. Standard machines handle packages weighing up to 10 lb. Heavier packages can be handled by machines of special design.

Overhead Conveyers BOOST PRODUCTION 400 PCT CUT HANDLING 50 PCT

By L. F. Spencer
Chief Metallurgist
Landers, Frary & Clark
New Britain, Conn.

- Consumer goods plant has increased use of conveyers ten-fold over past 5 years . . . Ten trolley-type systems plus many motor-driven roller-belt and gravity conveyers are involved.
- Standardized conveyer pallets and plating-tank racks simplify carriers . . . Periodic lubrication is only maintenance needed.
- Trolley system 1¼ miles long moves at 6 fpm . . . Load capacity per carrier is 150 lb for 3-in. I-beam track; 300 lb for 4-in. I-beam track.

◆ MECHANICAL HANDLING of parts in process, transportation and shipping of finished goods have increased ten-fold within the past 5 years at Landers, Frary & Clark. Conveyers are now used in all of the manufacturing divisions of this concern which has been in continuous operation since 1842.

Because materials handling is the greatest single item of indirect factory expense, conveyer equipment was installed on a planned program basis. At present, the company has a total of ten separate conveyers.

Trolley-type conveyers were selected as this transportation medium has almost unlimited possibilities in both handling capacities and flexibility of path for any distances. The conveyer can be held close to the ceiling when head room is required or lowered to bring the load to the working area.

A thorough job analysis had to be performed in order to obtain the maximum efficiency of each conveyer system. This problem was further complicated because the various manufacturing operations of an item, like the Coffeematic, were divided in two adjoining multi-story buildings. These two buildings were joined by a 56-ft passageway directly in the center on all six floors with the exception of the 1st floor. This necessitated a scale, **three-dimensional layout** or model in which the path of the conveyer from floor to floor could be

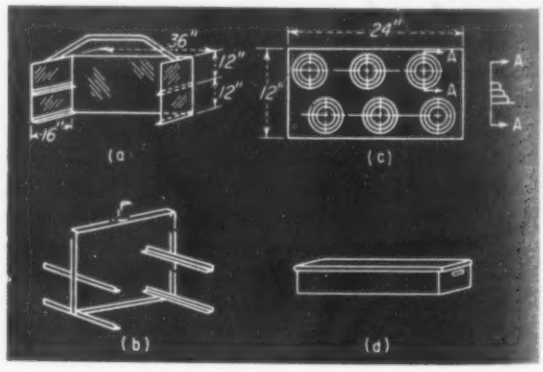


FIG. 1—Most widely used carriers are (a) and (b). Type (a) transports pallet box (d) while carrier (b) usually transports a pallet. (c).

easily followed and judged for its efficiency.

Over 1¼ miles of new trolley-conveying equipment has been installed within the manufacturing division devoted to the production of small appliances. The advantages realized which justify this expenditure are:

(1) Increased productive capacity; the production of the coffee percolator was increased four-fold.

(2) Reduction in materials handling which was previously performed by trucking from floor to floor. The increase of plated goods was three-fold and the materials-handling employees have been reduced approximately 50 pct.

(3) Due to decrease in materials handling, damaged goods have been reduced.

The trolley conveyer has proven economical in operation and maintenance by merely requiring periodic lubrication. The load-carrying capacity of these conveyers varies with the dimensions of the I-beam track. The 4-in. I beam on conveyer Nos. 4 and 7 permit a load capacity of 300 lb per carrier while the 3-in. I beams will take a load of about 150 lb per carrier.

Each conveyer line is equipped with a chain grab in case the chain should break. Due to difficulty experienced in jamming of the carriers in the inclined openings leading from floor to floor, another safety precaution has been added. This consists of an arm and a limit switch at each port of entry of the conveyer. A turned carrier bumps an arm actuating a limit switch which immediately shuts off the conveyer. At the same time an elevator enunciator centrally located, is activated which indicates the position where the difficulty is experienced.

Two of the more widely-used carrier types employed are illustrated in (a) and (b), in Fig. 1. For type (b), the cross-angle irons are 12 to 14 in. apart depending upon the load type. In most instances, this type carrier transports a pallet as indicated in (c), Fig. 1. These pallet boards are designed with six plugs, each plug having three-stepped diameters for the placement of drawn shells which permits use on three separate diameter openings within the formed shell. In addition, these plugs are coated. Plastisol similar to that used for plating racks materially reduces damaged shells.

The carrier type shown in (a), Fig. 1, has three enclosed sides with cross-angle irons spaced approximately 12 in. apart. In this type of carrier, either a plain pallet board or a carrier box like (d) is used. The plain pallet board is used for relatively large formed and plated items which can be stacked and protective paper is used between each item to minimize contact damage. The carrier box is employed for smaller-plated component parts intended usually for final assembly.

Conveyer spacings depend upon the type of carriers employed. On both conveyers, the main-transport conveyer, No. 4, and the buff conveyer, No. 7, a center distance of 8 ft is used between carriers of type (a). For carriers types (a) and (b), a space of 6 ft is used while the spacing between two carriers of type (b) is 4 ft. On these two conveyers, in sequence order, two carriers of type (a) are followed by two carriers of type (b), etc.

The distance between four consecutive carriers in the order given will occupy a spacing of 24 ft. On conveyer Nos. 1, 3, 8, 9, and 10, type (b) carrier is usually employed with a spacing of 4 ft. On conveyer Nos. 2, 5 and 6, spacing between racked work is usually 2 ft. Other pertinent data on these various conveyer systems are given in the table.

In the small appliance division, flow of material proceeds from floor to floor starting with

TEN CONVEYERS IN THIS SYSTEM

	Conveyer Identification									
	1	2	3	4	5	6	7	8	9	10
	Spin and Polish	Wash	Solder	Main Transport	Nickel Plate	Chrome Plate	Buff	Spin	Assembly Feed	Assembly Cool
Speed of Operation, Feet per Minute	6	6	6	9	6	6	9	6	6	6
Length of Conveyer, Feet	860	190	460	1200	334	540	1040	550	600	180
Time Cycle, Minutes	144	32	78	134	60	83	120	92	100	30
Trolley Spacings, Center to Center	2 feet on all conveyers									
Number of Carriers When Fully Loaded	215	95	115	200	167	270	172	137	150	40
Load Carrying Capacity per Carrier, Pounds	150	150	150	300	150	150	300	150	150	150

press drawing on the 1st floor and completing in plating on the 6th floor.

The beginning of the mechanized setup begins on the 2nd floor as is indicated in the floor plan, Fig. 2. For items that are to be spun, like the body of the coffee percolator, the drawn shell is trucked to area A, as indicated.

Primary function of the spin conveyer, No. 8, is to feed the spinners. Preliminary work such as rough-machine buff, trim, etc., is performed on the drawn shell in that area indicated in Fig. 3, after which the work is placed on peg pallets. These pallets, containing six shells, are then placed on the No. 1 conveyer.

As shown in Fig. 3, the location of conveyer line No. 8 is ideal for rapid transfer for spinning; the operator just reaches forward to obtain a pallet of shells when required. After spinning has been completed, the loaded pallet board is placed on conveyer No. 1 which is directly in back of the spinners. The purpose of No. 1 conveyer is to transport the work to the 3rd floor where it is subsequently buffed. Conveyer No. 1 traverses the 3rd floor as indicated in Fig. 4 and feeds approximately 45 buffers.

Copper base shells buffed

A shell that has been spun enters from the spinning room on conveyer No. 1. The first transfer for the various station areas of both hand and machine buff are designated. In this area, formed shells made from either copper or copper-base alloys are buffed. After buffing has been completed, the peg pallets containing the work is again placed on conveyer No. 1 to inspection point A, Fig. 4. At this point, all shells that pass critical inspection are placed on a roller conveyer to various stations for preliminary press operations which is done prior to actual wash.

The transfer point to the wash conveyer No. 2 is at point B, Fig. 4. The material returns to this transfer point after completion of the cycle. Conveyer No. 2 is illustrated in Fig. 5. After washing, the work is again transferred to another roller conveyer for additional press operations such as embossing, trimming, beading, etc. After inspection, the shells are transferred to conveyer No. 3 so that the necessary soldering operations can be performed. After these operations have been completed, the shells are again transferred to the wash conveyer at point D, Fig. 4, and returned to this same point for transfer to a roller conveyer for inspection, point E.

All shells that pass this inspection are placed on the main-transport conveyer, No. 4, where it bypasses both floors 4 and 5. There are also a number of items that are press drawn from steel which enter the conveyer line on the 3rd floor. These items are trucked to area G, Fig. 4, where they are buffed and placed on the main-transport conveyer, No. 4, to the transfer point F, Fig. 4, where the items are inspected

All parts that pass inspection are again placed on the main-transport conveyer for their journey to the 6th floor to be color buffed and plated. On this floor, conveyer Nos. 1 and 4 cross over the buff and spin conveyer, No. 1, hugs the ceiling permitting the main-transport conveyer, No. 3, to pass underneath.

Conveyerizing of this floor is complete, see Fig. 6. One additional benefit realized is that the majority of the work is suspended on the conveyers rather than occupying valuable floor space. Inspection areas have been placed at the most critical points to prevent unsatisfactory work from continuing to the other operations. Rejected material is suitably tagged as to the nature of the defect before it is rerouted to the various departments for rework.

The next step is the color-buff and subsequent plating operations that are located on the 6th floor. The conveyer layout and floor plan is given in Fig. 6.

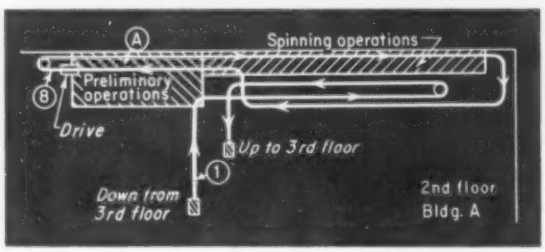


FIG. 2—Two conveyers, Nos. 8 and 1 serve the spinning department located on 2nd floor of building A. This is the beginning of the mechanized setup.

FIG. 3—Spin conveyer, No. 8, hugs the wall in front of spinners. Buff conveyer, foreground, takes spun work to the 3rd floor for further processing.

The work comes from the buffing room on the main-transport conveyer, No. 4; the area of entry is illustrated in Fig. 7. The work is transferred at point A, Fig. 6, to conveyer No. 7 to be color buffed. Work is returned to the same transfer point for inspection and racking for nickel plate. As is indicated by the floor plan, the buff conveyer, No. 7, has complete coverage of the entire room and services a considerable number of buffers.

The racks employed for plating are of varied design; the inspected work, both steel and the copper-base alloys, being placed on the nickel conveyer line, No. 5. All the racked work enters a central washing system which is incorporated within the line. At point B, Fig. 6, the work is transferred to the plating tank; the steel parts are placed in one cycle which permits a flash of copper prior to nickel plate; whereas, the items made from a copper-base alloy are placed in another plating cycle which permits a direct plate with nickel.

After plating, the racked parts are again placed on conveyer No. 5, the nickel plate line, at inspection point A. Satisfactory goods are then placed on the buff conveyer, No. 7, for feeding to the operators for nickel buff. The buffed worked, after it traverses the distance to inspection point C, is inspected and racked for chromium plating; satisfactory work is placed on conveyer No. 6, the chromium line. This material also passes through a central washing system after which it is routed to the various automatic chromium-plating lines. Upon its return on the same conveyer line, the plated work passes through a drier to point C, is unracked, nested or placed on suitable pallets and placed on the main-transport conveyer on its downward journey to assembly.

Fig. 8 is a view of that area where parts are racked for chromium plate; the operator in this instance is taking off work from the line. The buff conveyer, No. 7, is also shown on the very top of this illustration. The layout on the 5th floor is indicated in Fig. 9. The two conveyers that pass through this floor, No. 4, bring the work to the assembly lines and the assembly-feed conveyer, No. 9.

As plated goods come from the 6th floor, the items are taken off the main-transport conveyer at point A, Fig. 9, and inspected in the area

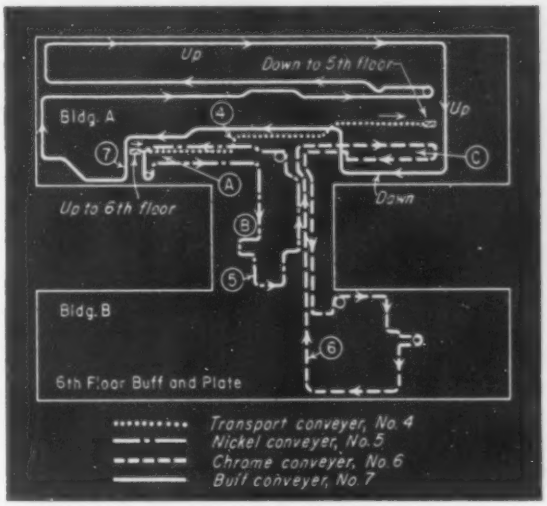


FIG. 6—The 6th floor of both buildings uses four conveyers to handle buffing and plating operations.

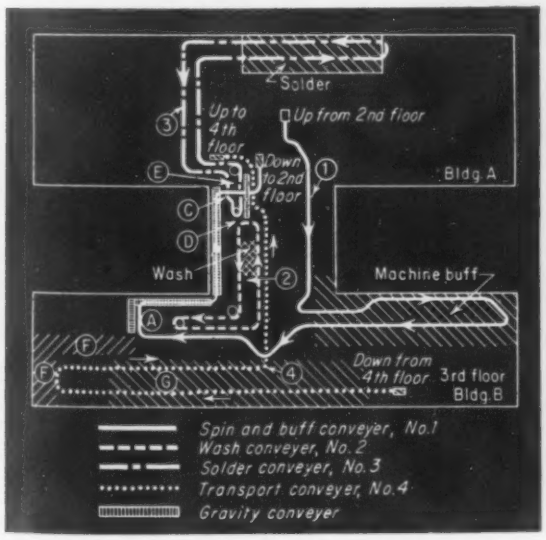


FIG. 4—Four conveyer systems serve the 3rd floor of both buildings A and B. Main conveyer, No. 4, feeds all areas located on this floor.

FIG. 5—Wash conveyer, No. 2, foreground, brings parts out of washer. Spin and buff conveyer, No. 1, is in the background. Both are on the 3rd floor.

indicated. In this area, all plated ware with the exception of the toaster parts is inspected. Because all toasters after being completely assembled are tested, conveyer No. 10 has been added to permit cooling of toasters after testing.

At inspection point A, Fig. 9, percolator and hand-iron component parts are placed on the feed conveyer, No. 9, for transport to the assembly lines. The transfer point for percolator assembly is at point C, whereas the transfer point for the hand irons is at point D.

Finished packaged goods are placed on a roller-belt conveyer, Fig. 9, which hugs the outside wall of the building, for transportation to the shipping department, Fig. 10. Packaged goods from this conveyer and the packaged goods from a belt conveyer which is at right angles meet at point E. This is diverted to an overhead, enclosed roller-belt conveyer which traverses a distance of approximately 900 ft to the shipping area. Prior to entry at Point E, all packaged goods from both the 4th and 5th floors are tallied on a mechanical counter. An additional check is obtained by an electric eye.

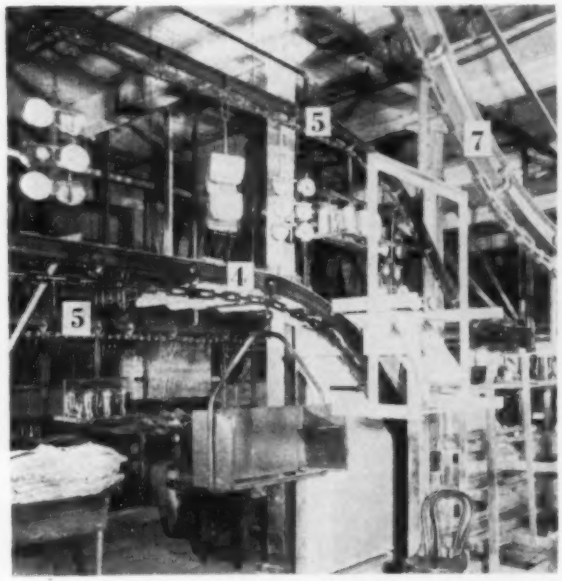


FIG. 7—Racking and inspection area for nickel plate on 6th floor is served by conveyer No. 5. Conveyer No. 4 is shown coming up to the 6th floor. Buff and polish conveyer. No. 7, at extreme right.

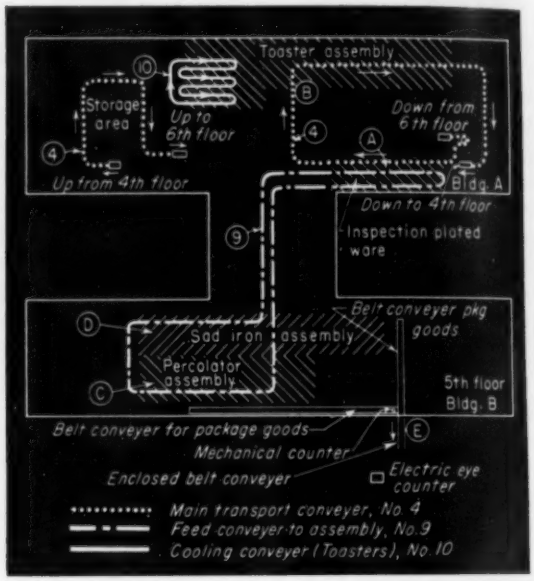


FIG. 9—The 5th floor of both buildings is served by conveyers Nos. 9, 4 and 10. Mechanical and electric-eye counters permit up-to-the-minute check on output. Conveyer then carries goods over into shipping department.

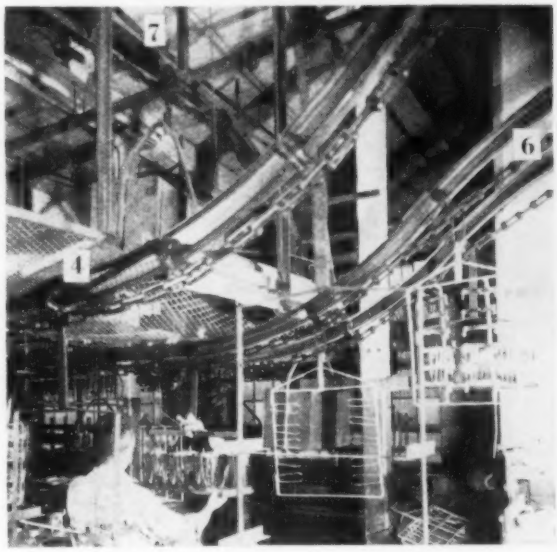


FIG. 8—Inspection area for chrome-plated goods is served by conveyer No. 6. Conveyers 4 and 7 pass by this area but are kept out of the way of the main operation at this particular point.

FIG. 10—Packaged goods are stenciled as they move on belt conveyer in the shipping room. After packages have been stenciled, they are diverted into either one of two channels for shipment by rail or truck.

PNEUMATIC CONVEYERS Speed Small-Parts Delivery

◆ Orders for small parts are filled in 5 min, saving 25 to 55 min per order . . . Delivery to assembly points assures uninterrupted production . . . Maintenance costs are low—savings high.

◆ A FAST, FLEXIBLE delivery service for small parts is essential for keeping the assembly departments moving smoothly at the Burroughs Adding Machine Co., Detroit plant. Regular delivery of parts is by truck or conveyer, but to supplement this service, pneumatic tubes conveyers speed the delivery of small parts to two light-assembly departments.

The main stockroom stocks more than 70,000 parts, 10,000 of which may be required in the assembly of a single business machine. Ordinarily, 30 to 60 min were needed to process an order for extra parts. With the pneumatic-tube systems, an order can be fielled in about 5 min. Obviously, savings are substantial.

Transparent plastic carriers with felt end seals carry as much as 6 lb of parts from the stockroom to the assembly departments in one delivery. The average order weighs 3 lb or less. A special carrier handles light pieces up to 18 in. long through the 4-in. OD tubes.

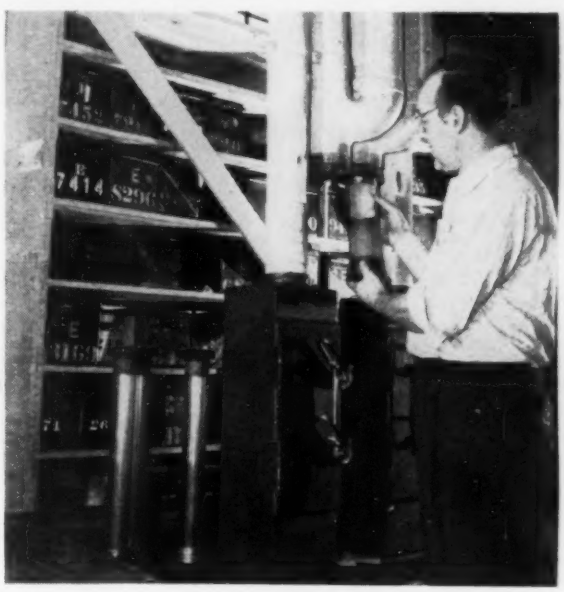
When an operator in the assembly department runs low on parts, the job setter is notified. He fills out a requisition and sends it to the stockroom through the pneumatic conveyer. An indicator light signals the stockroom attendant of its arrival. The order is filled immediately and the carrier sent to the assembly department where another indicator light signals its return.

In filling an order, counting of thousands of small parts would be a tedious and time-consuming job. Therefore, parts are weighed on a special balance scale.

The two pneumatic conveyers were built by Grover Co., Detroit. One is 125 ft long and the other is 175 ft long. Both operate on an air pressure of 24 psi.

Assembly procedures require the rejection of parts with foreign matter and those bent during assembly. The pneumatic conveyers replace the supply of such parts quickly and efficiently. They also help to keep assembly operations moving without interruption. Maintenance expenses have been very low.

SPECIAL SCALE relieves stockroom employees of tedious and time-consuming job of counting small parts.



PNEUMATIC-TUBE CARRIER about to be returned to the assembly department with an order of small parts. An order that previously required 30 to 60 min to fill is now returned in about 5 min.

Work-Handling Devices IMPROVE QUALITY, REDUCE MACHINE-CYCLING TIME

By E. C. Beaudet
Machinery Editor

◆ One of the most fruitful means of lowering overall machining time lies in the application and development of more automatic work-handling devices.

◆ Although they have shown to greatest advantage in transfer-type machines, their use is steadily increasing on standard and semi-automatic equipment . . . Automatic handling of parts in machining processes reduces costs, improves quality and lessens operator fatigue.

◆ AUTOMATIC LOADING and unloading devices and methods which cut floor to floor time may be the most promising area for reducing overall machine costs. Materials handling applied to machining operations can be thought of primarily in terms of loaders, unloaders and in-process mechanisms which transfer a part through the noncutting portions of the machining cycle.

Although the greatest progress in reducing parts handling has been achieved in transfer-type machines, there is an ever-increasing trend toward the use of more automatic handling devices on standard machine tools. To improve parts handling between the points where transfer mechanisms in an in-line operation leave off and actual cutting takes place, the Ford Motor Co. has made effective use of automatic-handling devices in the production of small and medium-sized parts on standard, semi-standard and special machine tools.

Rough and finish boring of wrist-pin holes on pistons, for example, was formerly done on a six-spindle horizontal duplex boring machine, see Fig. 1. Pistons were loaded and unloaded manually and held in a work-holding fixture for machining. One man operated two machines.

Because of its greater adaptability to automatic loading and unloading, an automatic single-spindle horizontal machine, Fig. 2, replaced the above equipment. Pistons are fed from a belt conveyer into a gravity chute which leads them to the machine loader. The cycle is as follows: Loader guides open to release a piston onto rollers which revolve the piston; locaters then engage a slot in the skirt and a pin hole and the piston ceases to revolve. A four-fingered carrier chuck then clamps onto the piston and moves it into the boring fixture.

At the same time, an internal clamp moves in from the opposite direction and grips the piston on the inside diameter. With the piston clamped and in position, the boring head moves in and bores the wrist-pin hole. Upon completion the boring head retracts, and the internal clamp withdraws to the out position. At this point the cycle is repeated and the next piston entering the boring fixture pushes the finish-bored piston into an ejection chute leading to another conveyer belt.

FIG. 1—Old method of manually handling pistons. Wrist-pin holes were formerly bored on this machine. But . . .

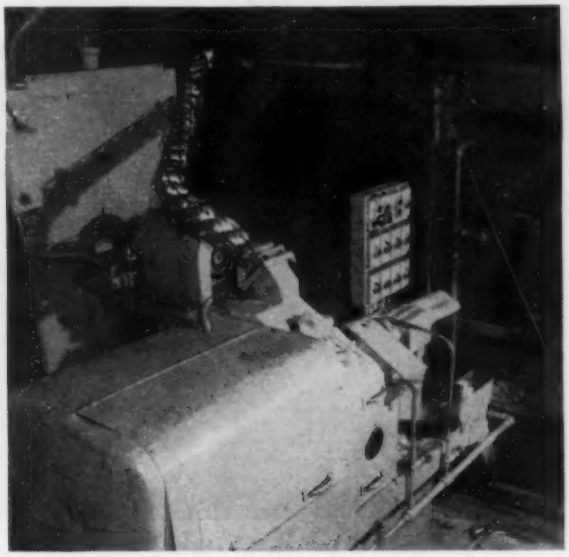


FIG. 2—Wrist-pin holes are now bored on this single-spindle unit with automatic loading and unloading.

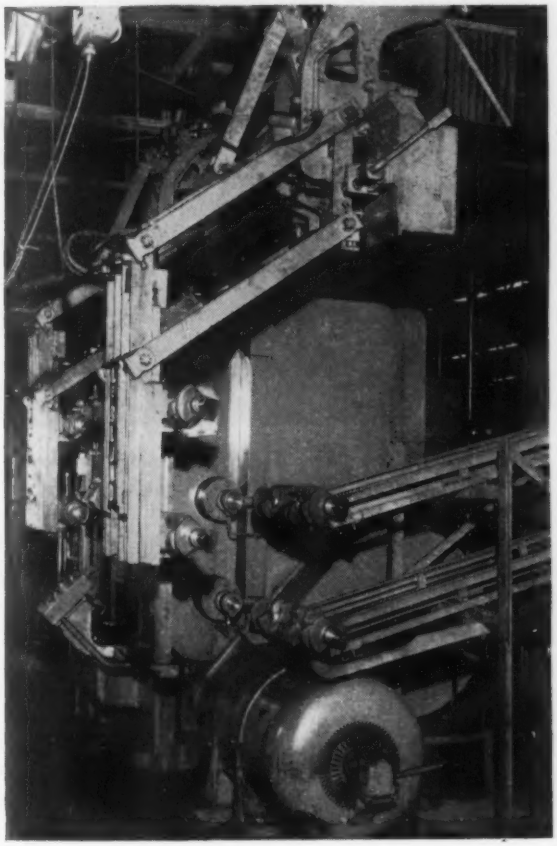


FIG. 3—Automatic-handling mechanism loads and unloads two crankshafts and lessens operator fatigue.

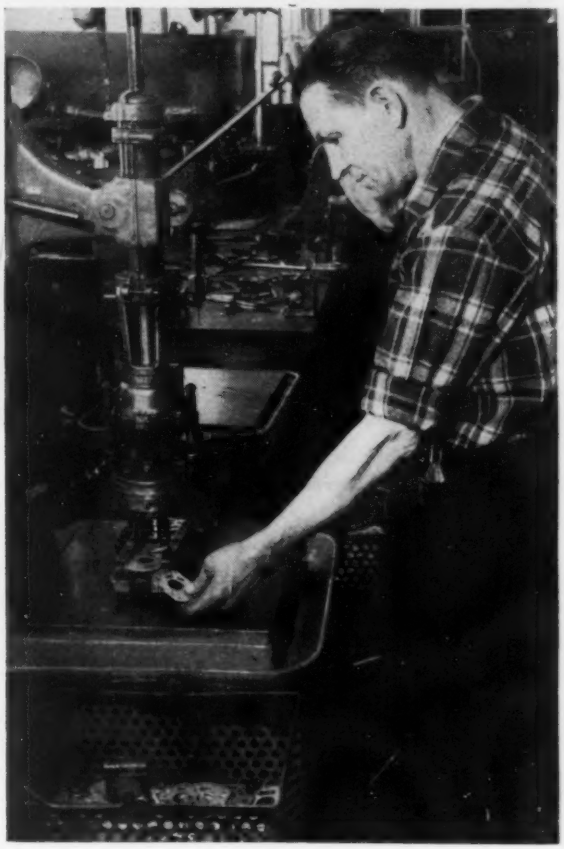


FIG. 4—One of three conventional single-spindle vertical drilling machines used on breaker plates.

In turning crankshaft-pin bearings a duplex machine, shown in Fig. 3, was developed to machine 2 crankshafts at a time. Rough and finishing operations are combined and two crankshafts are produced for each machine cycle.

Automatic loading and unloading for this operation was achieved by means of 2 horizontal, power-actuated carriers, suspended from a common rail, one carrier on each side of the machine. The right-hand carrier takes 2 parts from the stock rack and loads them in the ma-

FIG. 5—Automatic six spindle machine which has replaced single-spindle vertical drilling machine.

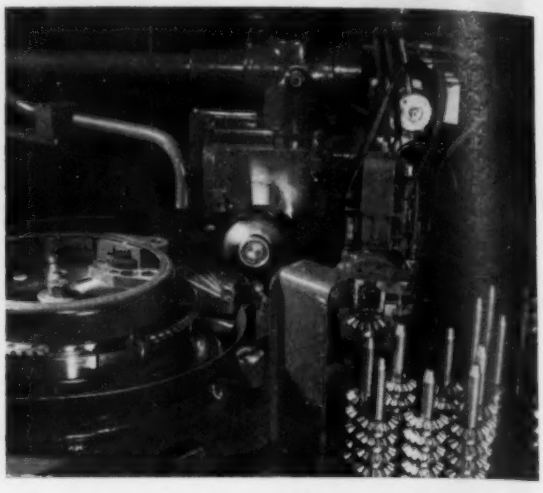


FIG. 7—Automatc loading and unloading device is used on single-spindle machine for cutting gear teeth.

FIG. 6—Manually loaded, three-spindle machine for cutting straight bevel teeth on pinion gear.

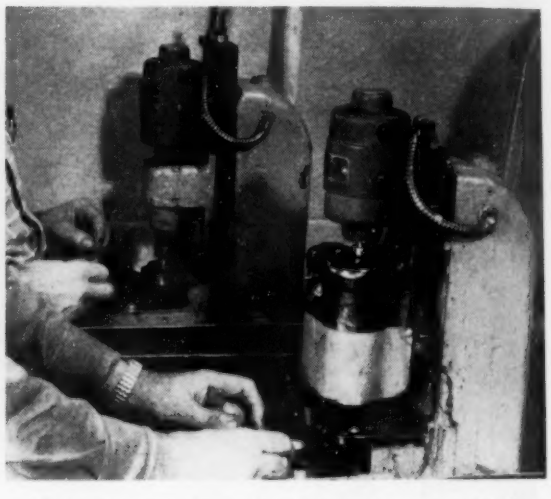


FIG. 8—Two separate machining operations meant double handling with this old method of machining switch.

chine. The left-hand carrier removes 2 machined parts and places them on another stock rack. Locating and clamping of the piece is accomplished by power actuation; however, the operator is required to assist in positioning and clamping. The new machine combined with this automatic handling device has reduced operator fatigue and produces a better product at lower cost.

Drilling, reaming and tapping holes in distributor breaker plates on 3 standard single-spindle upright-drilling machines shown in Fig. 4 was done at a rate of 200 parts per hour and required 3 operators.

With the automatic six-spindle vertical drilling, reaming and tapping machine now used, Fig. 5, parts are manually loaded into nests in the rotary-dial index table. They are then carried to the work stations of the machine where one hole is drilled, two reamed and three tapped. As the parts index from the loading point, they pass under a rail which clears the parts by about 1/16 in. This holds the parts down as the taps retract.

Each time the table indexes, a finished part is produced and ejected into a stock pan as follows: At the unload station, a vertical bar, mounted on the head of the machine, travels down with the head as the machine cycles, and tips the part through a cut-out recess in the fixture base into a chute which drops the parts into a pan.

Quality has been improved by eliminating the handling required between operations by the former method. The machine can now be loaded from a sitting position, and automatic feed has eliminated the hand feed, thus reducing operator fatigue. This small-sized, rugged and compactly-designed machine is ideal for machining operations on small parts. It permits produc-

FIG. 9—Combining machining operations on this spotfacing machine reduced manpower and improved quality.

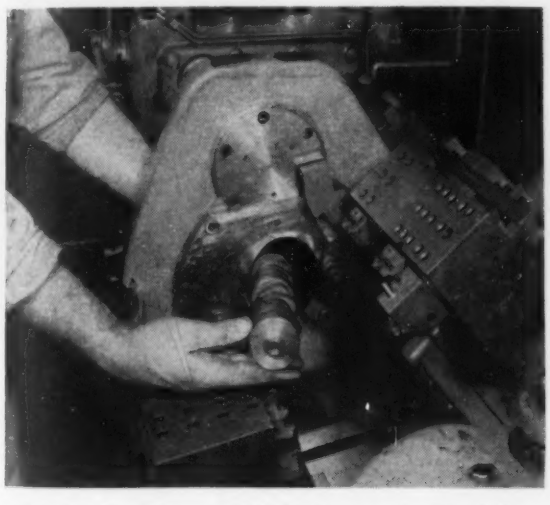


Fig. 10—Removing crankshaft from automatic lathe. Center-drive attachment is shown from tailstock end.

tion of 600 pieces per hour which represents a savings of 900 pct over the previous method.

Another efficient automatic-loading device was developed for use on a single-spindle No. 8 Gleason Revacycle machine for cutting straight-bevel teeth on differential pinion gears.

This machine replaced a No. 6 Gleason machine of the same type whose chucking was controlled by a single hydraulic lever which permitted the operator to load and unload 2 pinions while a third was being machined, see Fig. 6. Due to the limited capacity of the work arbor, one operator was assigned to 2 machines. The automatic loading and unloading device on the No. 8 machine, with a capacity of 57 gears, makes chucking of the work entirely automatic. An operator is shown loading the stock rack in Fig. 7.

In operation a swinging arm with automatic fingers picks up the gear blank from the rack and places it in the machine. After the gear is cut, the same arm removes it from the machine and places it on the finished stock rack. The machine spindle is equipped with a chuck that automatically stops the cycle whenever the gear blanks are not premachined to proper locating size. The plate holding the stock rack indexes for loading and unloading. Manual handling of the gears has been reduced 70 pct and due to its automatic features only one operator is needed to run five machines.

On a stoplight-switch base two separate machining operations, shown in Fig. 8, were required. Drilling two terminals was done on a six-station, double-spindle machine. The part was then passed to a second operation where it was spotfaced with an end mill on a four-station, single-spindle machine. Both operators loaded and unloaded the fixtures only, the machine being run on an automatic cycle. Production was 559 pieces per hour.

Both drilling and milling operations are now performed on a single machine. This has been achieved by mounting 2 air-powered drill units on a Ford-designed, bench-mounted spotfacing machine, see Fig. 9. A four-station rotary table carries the parts from operation to operation. The parts are loaded and unloaded by the operator and production is at the rate of 993 pieces per hour.

Get more from carbide tools

The latest method of machining camshafts on an automatic high-speed lathe shown in Fig. 10 combines all the operations formerly done on four machines requiring four operators. The high-production capacity of this machine, its simplicity of operation, extreme accuracy and rugged construction make it very suitable for the best use of carbide tools.

One of its distinguishing features is the center-drive attachment for driving the part which is held between centers. Serving triple purpose, the center drive permits simultaneous machining of both ends and almost the entire length of the camshaft. It also acts as a steady rest, supporting the work at midpoint, and as a workpiece driver.

Tools mounted on the front carriage are used for turning diameters and tools mounted on the back arm are used for facing and chamfering. The multiple-tooling setup permits turning of several diameters and faces simultaneously.

Tool carrying members are supported by bar construction and cams control tool movements. The tools are moved forward to plunge cut, face and chamfer the part, then lateral movement is started and turning cuts are taken. After the cutting is completed, the tool carrying members return to starting position.

◆ Modern methods in a 100-year-old foundry have cut manhours 50 pct . . . Total operation now fits into a fourth less floor space . . . Production is cleaner, faster, easier.

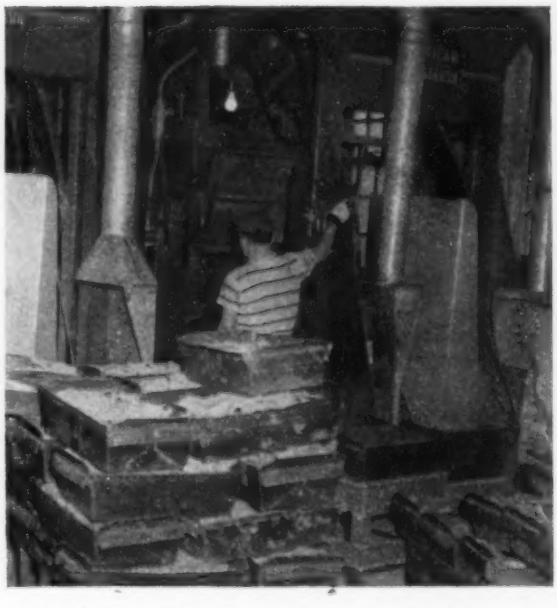
Modern Handling Commutes Hard Labor In Small Foundry

◆ MODERNIZATION of a 100-year old iron foundry is nearing completion at New Britain, Conn. The P & F Corbin Foundry Div., American Hardware Corp., has equipped the plant with the latest and best in materials-handling devices.

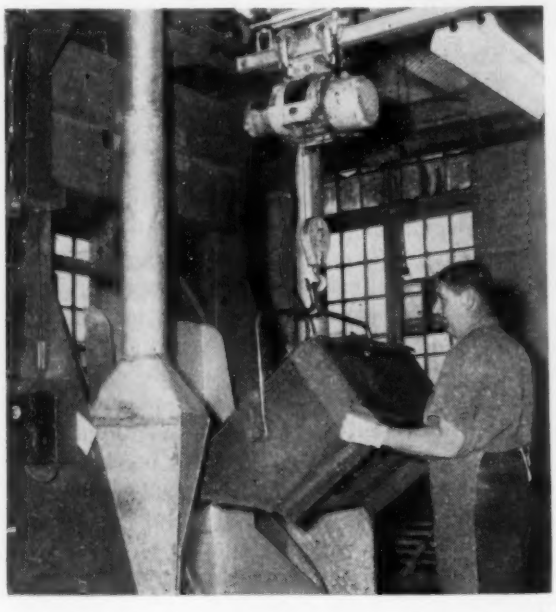
The casting and shakeout departments were completed about a year ago and work has just been completed in the spruing, cleaning and inspection departments.

The foundry produces 15 tons of castings each day. Molds are dumped on a central conveyer belt and carried to a shakeout. Castings pass over a screen, located on the floor below, down a chute and fall into buckets. These buckets are then picked up by monorail cranes and the castings are charged directly into the skip hoist of one of the two Wheelabrator machines.

Previously the castings discharged onto the



BEFORE monorail-handling system was installed operators had to pick up loaded buckets shown in the foreground and dump them into the skip hoist.



AFTER modernization, operators were able to charge skip hoist faster and without manual effort. Speed and ease of operation helped smooth out work flow.

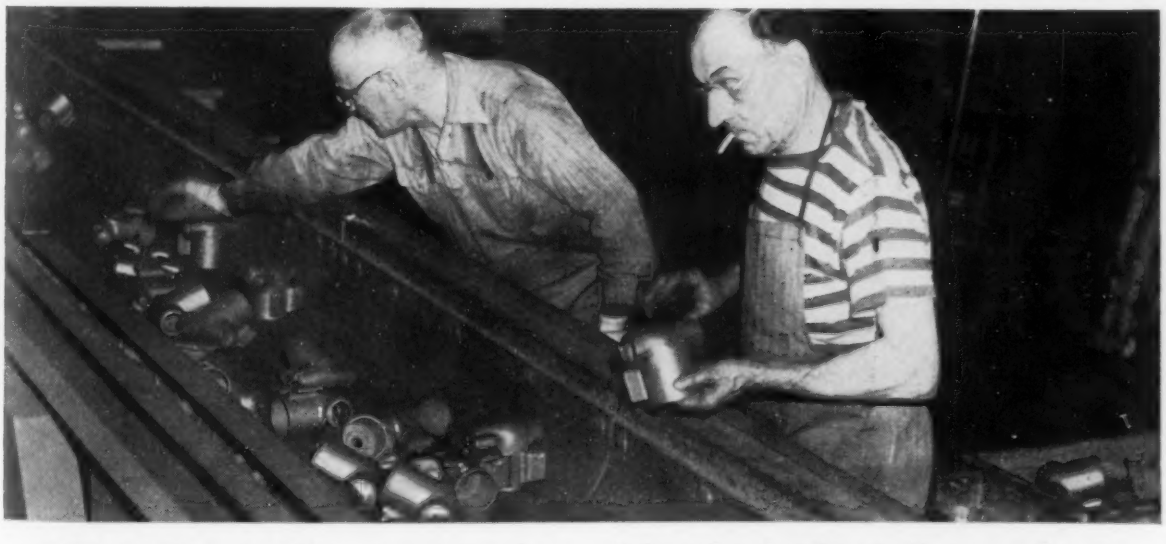
floor where three or four men were kept busy loading them into tote boxes.

Now the Wheelabrator operators are able to handle both assignments without difficulty. All lifting has been eliminated in charging the castings into the blast-cleaning machines.

The old method of spruing was a slow tedious job which required lifting of castings and 100-lb boxes of castings as shown in Fig. 4. Today all castings are now discharged from Wheelabrators into an oscillating conveyer from which they are sprued and inspected simultaneously.

The total operation now fits in a fourth the space previously required. It is cleaner, faster and easier. Working time required to sprue and inspect the shop's daily production has been cut from 72 to 30 man-hr per day through use of these modern machines and materials handling equipment.

BEFORE—Conditions made spruing a slow tedious operation. Buckets were limited to 100-lb charge to permit manual lifting. Usually three or four operators were kept busy loading castings in tote boxes.



AFTER—Installation of oscillating conveyer permits fast, easy spruing and inspection. Wheelabrator machines discharge cleaned casting onto this conveyer. Operation now fits in one fourth space previously required.

WALKIE-TYPE FORK TRUCK Operates in 6-ft Aisles

◆ New fork truck can move pallets into 6-ft aisles and under mezzanines less than 7 ft high without use of other equipment . . . It elevates, retracts and transports at same time.

◆ A WALKIE-TYPE, high-lift truck with a retractable fork was recently developed by the Chevrolet-Flint Parts Distribution Dept. Its advantage over other types of fork trucks is its ability to handle decked pallet containers in 6-ft aisles and under mezzanine areas without the aid of other equipment.

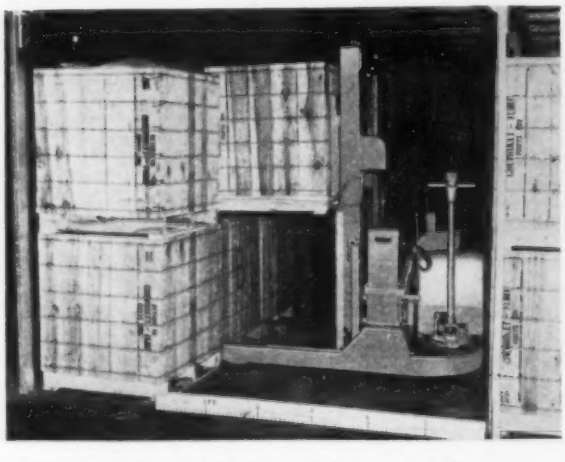
SPECIFICATIONS

Length	
Retracted	68 in.
Extended	99 in.
Width	36 in.
Height	
Minimum	79 in.
Maximum	119¾ in.
Free lift	38½ in.
Height of fork	
Maximum	95¼ in.
Weight with battery	2419 lb
Minimum aisle width	6 ft

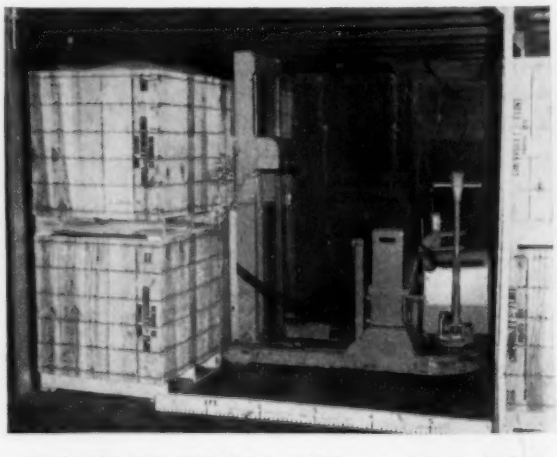
The new truck, called a Retractable Fork Pallet Stacker, has a capacity of 2000 lb. Its electrical control buttons permit the truck to elevate, retract and transport at the same time. The 6-ft aisles in which the truck will operate is considerably less space than that needed by other trucks of equal capacity. It can be used under a mezzanine as low as 80 in.

Free lift before raising the telescopic mast is 38½ in. The truck requires no space between pallets for the outriggers as do conventional straddle or outrigger-type trucks. Closed or open-faced pallets can be used without limits as to pallet size.

Any load that can be picked up can be handled without danger of the truck tipping. When handling loads of maximum capacity, positive traction is not delivered to the drive wheels until the load has been retracted to a safe position.



WALKIE-TYPE LIFT TRUCK, with fork retracted, removes pallet from 6-ft aisle without aid of other equipment. It can lift 2000 lb without danger of tipping.



ELEVATED AND EXTENDED FORK puts pallet in decked position under a mezzanine less than 7 ft high. The truck can elevate, retract and transport at same time.

Conveyers CARRY COLD-EXTRUDED ROCKETS to High Production Level

By W. G. Patton
Asst. Technical Editor

- Pontiac's new cold-extrusion plant is practically 100 pct conveyerized . . . Besides main line monorail system, Ajax annealing furnaces containing up to 7 separate conveyers are used.
- Cleaning, washing and phosphate-coating operations are completely conveyerized using the main monorail system . . . Special plastic covered racks of one type handle the major load.
- Unique design makes plant efficient either as a pilot or mass production unit . . . All machining of the rocket nose, except threading, has been eliminated.

◆ FIRST MAJOR COLD-EXTRUSION operation in the automobile industry is now operating at Pontiac Div., General Motors Corp. The installation was planned to permit pilot production of rockets as well as volume production with a minimum change in processing and the extensive materials handling.

While first cost of this installation was high there are four compensating production advantages: (1) Elimination of all machining opera-

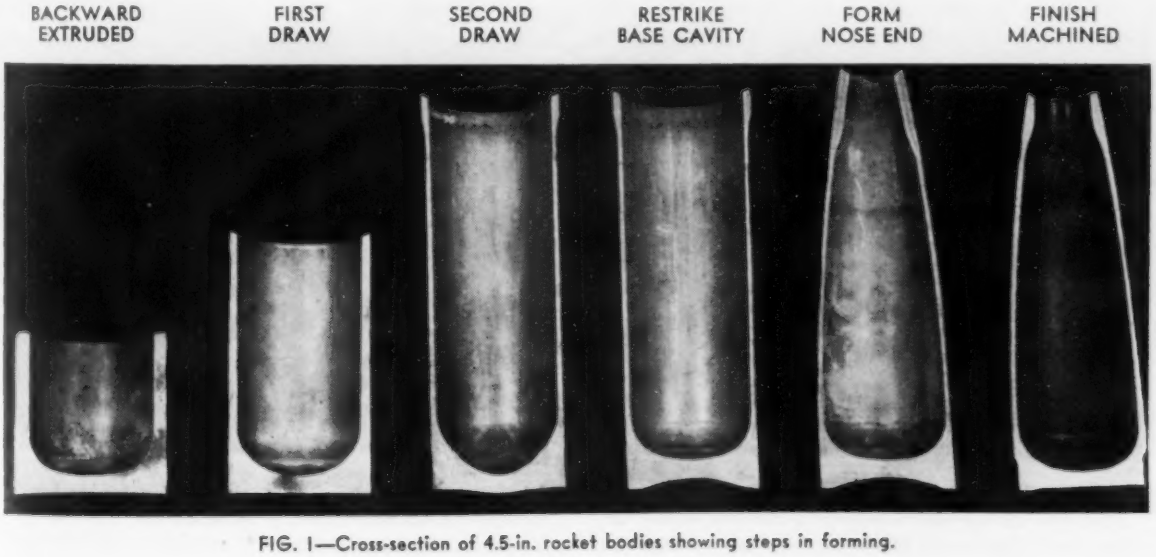


FIG. 1—Cross-section of 4.5-in. rocket bodies showing steps in forming.

tions (except threading operations on the nose and base), (2) efficient materials handling, (3) minimum steel requirements of chip handling and (4) uniform, high quality of the extruded steel product.

These advantages make this process particularly attractive for a high volume item like rocket projectiles, requiring close control of tolerances. Fig. 1 shows the projectile after each press-forming operation.

Fabrication of 4.5-in. rocket begins with the receipt of steel billets. As received from the mill, billets are 5 1/16 in. diam, 12 ft long, hot-rolled AISI 1015 steel. The steel is spherodized-annealed, pickled and oiled at the mill.

Bars are delivered to Motch & Merryweather automatic-cut-off machines in bundles and placed on a steel rack. An electric 1-ton hoist, hand-controlled, placed the bars one-at-a-time on the cut-off machine. Bars feed to proper length automatically. A single operator handles two cut-off machines easily. A three-dimensional model of this area of operation is shown in Fig. 2.

Discs 2⅜ in. thick are cut automatically from the 12-ft billets. Experience at Pontiac shows that billet length must be held within 0.020 in. to meet specifications. Even so, disc weight may vary as much as 6 oz because of variation in bar diameter and roundness. Flat spots on the bars, for example, may result in considerable variation in the finished product.

Following the cut-off operation the discs are placed on a wire-mesh conveyer and carried through a Cincinnati washer for rinsing and drying. Each steel disc is individually inspected and weighed. This step is taken to eliminate possible die breakage due to oversize blanks.

The parts are then placed on special plastic-coated racks, prior to coating with phosphate. An electric hoist, Fig. 3, is used to place the loaded racks on the overhead conveyer.

Design of the racks in which the blanks travel through the phosphate coating bath is unusual in several respects. The support of the rack is designed to tip the parts as they travel through the bath. A guide pin at the top of the rack makes it possible to change the angle of suspension as the racks pass through the bath. This assures adequate contact with the coating solution and also minimizes the possibility of interference from air bubbles.

Coating with phosphate is followed by dipping in a liquid soap bath. The soap bath is maintained at a minimum temperature of 140°F by means of steam coils. At this temperature the required amount of soap adheres to the phosphate coating.

Coated billets are delivered on the same

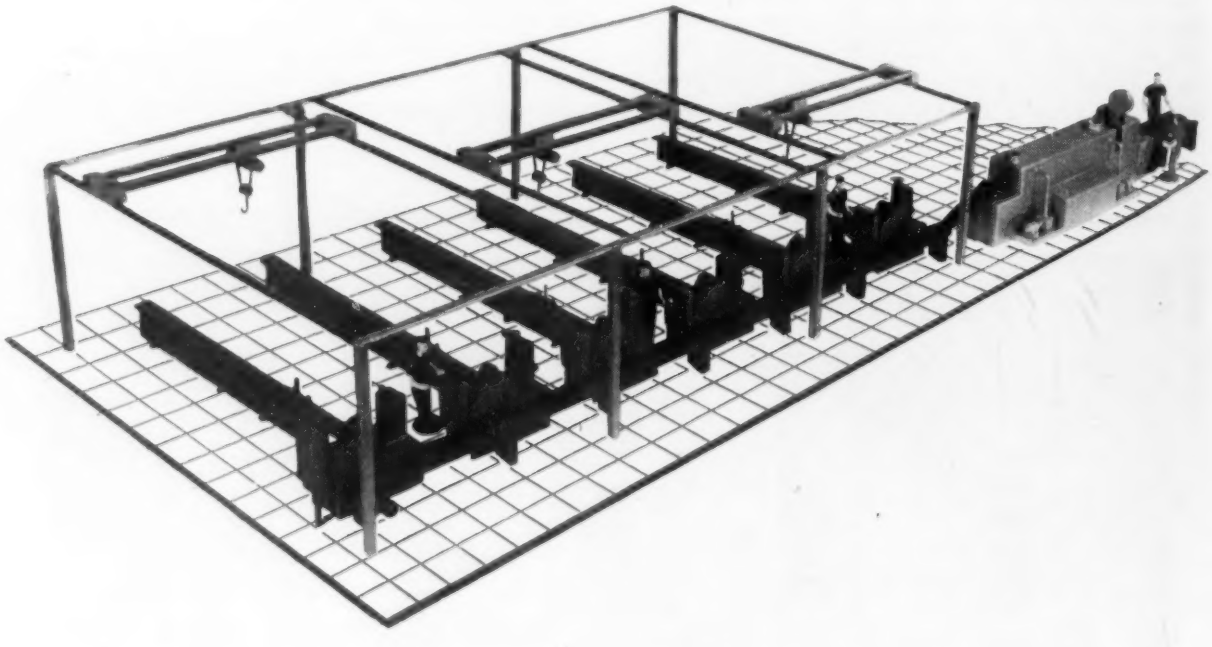


FIG. 2—Three-dimensional model of the cut-off area shows the six bar cut-off machines and the washer at the right. Cold-sawed billets fall onto belt conveyer in front of cut-off machines and are taken automatically through the washer. Disks 2⅜ in. thick, cut from 12-ft bars, are held within 0.020 in.

racks by overhead conveyer to the first extrusion press, Fig. 4. Discs are unloaded from the overhead conveyer rack and placed on a ¾-in. flat wooden pallet. The conveyer is a standard roller conveyer.

Meanwhile, the special rack suspended from the overhead conveyer continues to move on through a washer which cleans the fixtures and prevents possible contamination. The same racks must pass through the coating bath for the second, third and fourth forming operations.

A partial layout of the plant is shown in Fig. 5. The initial cold extrusion operation—backward extrusion—is performed in the 2500-ton clearing eccentric-type mechanical press. During this operation, a 5 3/32-in. diam cup is formed, Fig. 6. After this operation, wall thickness is 9/16 in.

Extrusion is continuous. Reduction during this operation is approximately 68 pct, which is just about the calculated maximum for cold extrusion. During this operation, base thickness is held within 0.030 in. Hardness of the extruded cup is RB 100 to 105 (RC 22).

Design of the die ring and punch have been worked out to meet the intensive pressure of over 300,000 psi generated during the extrusion operation. A 12-in. OD ring is used in the first clearing press. The bore of this ring is straight for a distance equal to the height of the billet, a 2° taper is used for clearance. Similarly, punch diameter is reduced 1/32 in. to provide clearance.

Punch design assures a proper flow of steel during the cup-forming operation. The nose tip presently being used has a 5 to 7° slope from the center of the punch.

The 12-in. diam die ring is pressfit into a 12-in. thick, 53-in. diam cast steel die shoe. During fitting, the bore of the ring contracts as much as 0.010 in. Experience shows that a tight pressfit is essential to the success of the operation. The die ring is heat treated to RC 60.

Punches used thus far at Pontiac have been made from 18-41-1 high-speed steel. The present punch was given a triple draw treatment, followed by a subzero cold treatment. This was followed by liquid nitriding. Galling and scoring of the punch are the principal operation problems that have to be met. Punch breakage has not been a serious factor.

Following the backward extrusion operation, the extruded cups are placed on a rubber-coated, convex roller conveyer for delivery to the Ajax annealing furnace. Here parts are loaded on special racks, Fig. 7. The parts automatically, in and out of the salt bath and final rinse. The parts are annealed for 20 min at 1250°F and then loaded on another concave,

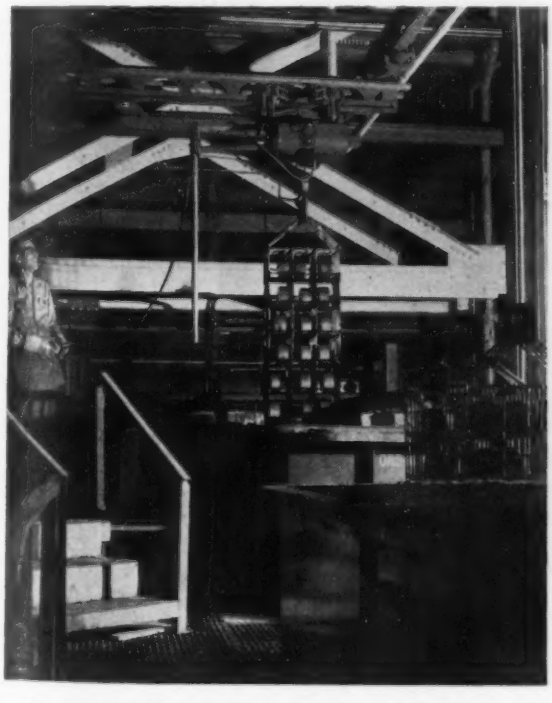
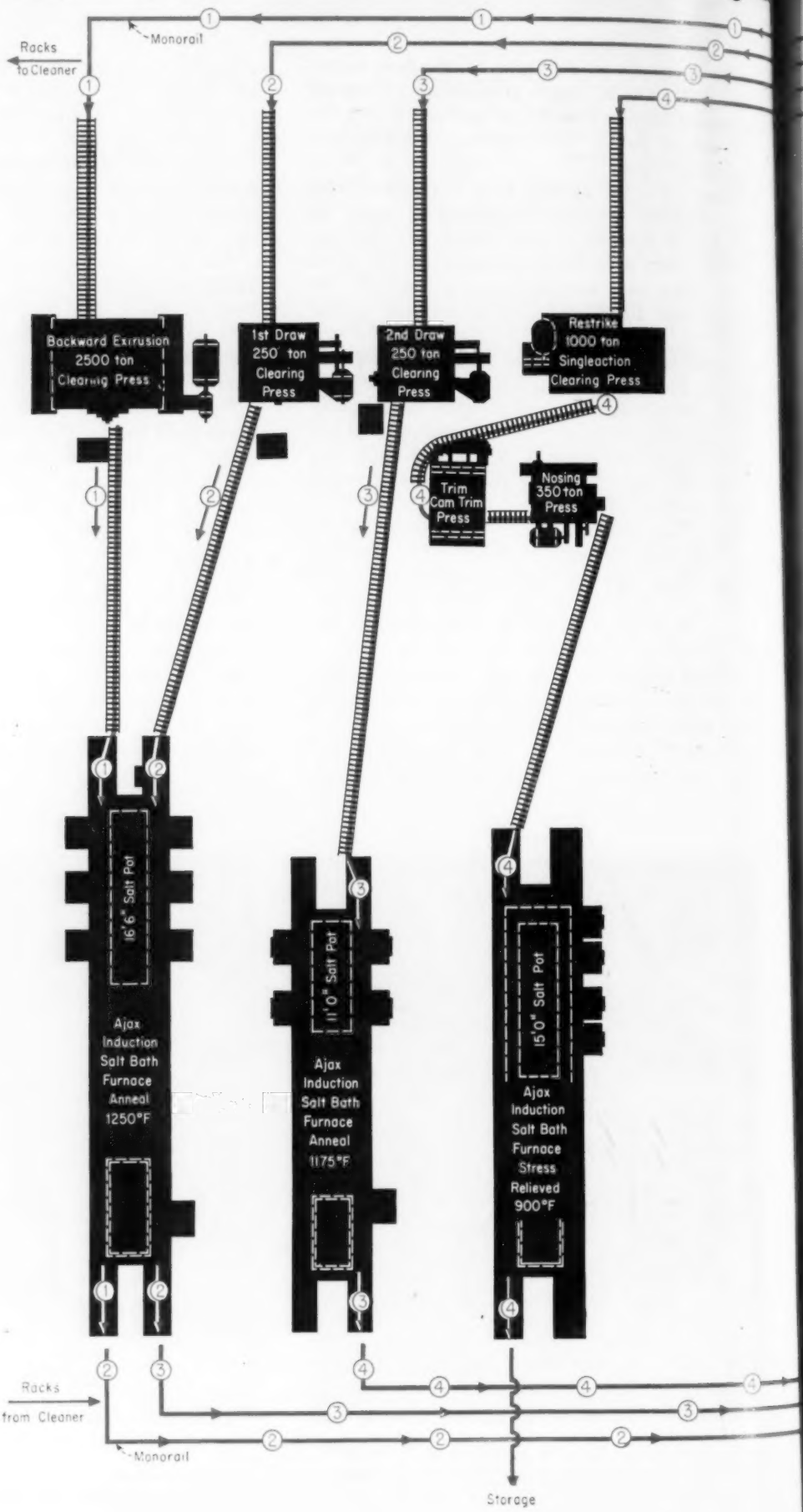


FIG. 3—Electric hoist picks loaded racks off monorail system and transfers the racks to the pickling and phosphate-coating machine.

FIG. 4—Billets coated with phosphate lubricant and soap on their way to the cold-extrusion press. The same racks are used through three further operations.


Racks to Cleaner
Monorail
Backward Extrusion 2500 ton Clearing Press
1st Draw 250 ton Clearing Press
2nd Draw 250 ton Clearing Press
Restrike 1000 ton Singleaction Clearing Press
Trim Cam Trim Press
Nosing 350 ton Press
16'6" Salt Pot
Ajax Induction Salt Bath Furnace Anneal 1250°F
11'0" Salt Pot
Ajax Induction Salt Bath Furnace Anneal 1175°F
15'0" Salt Pot
Ajax Induction Salt Bath Furnace Stress Relieved 900°F
Racks from Cleaner
Monorail
Storage

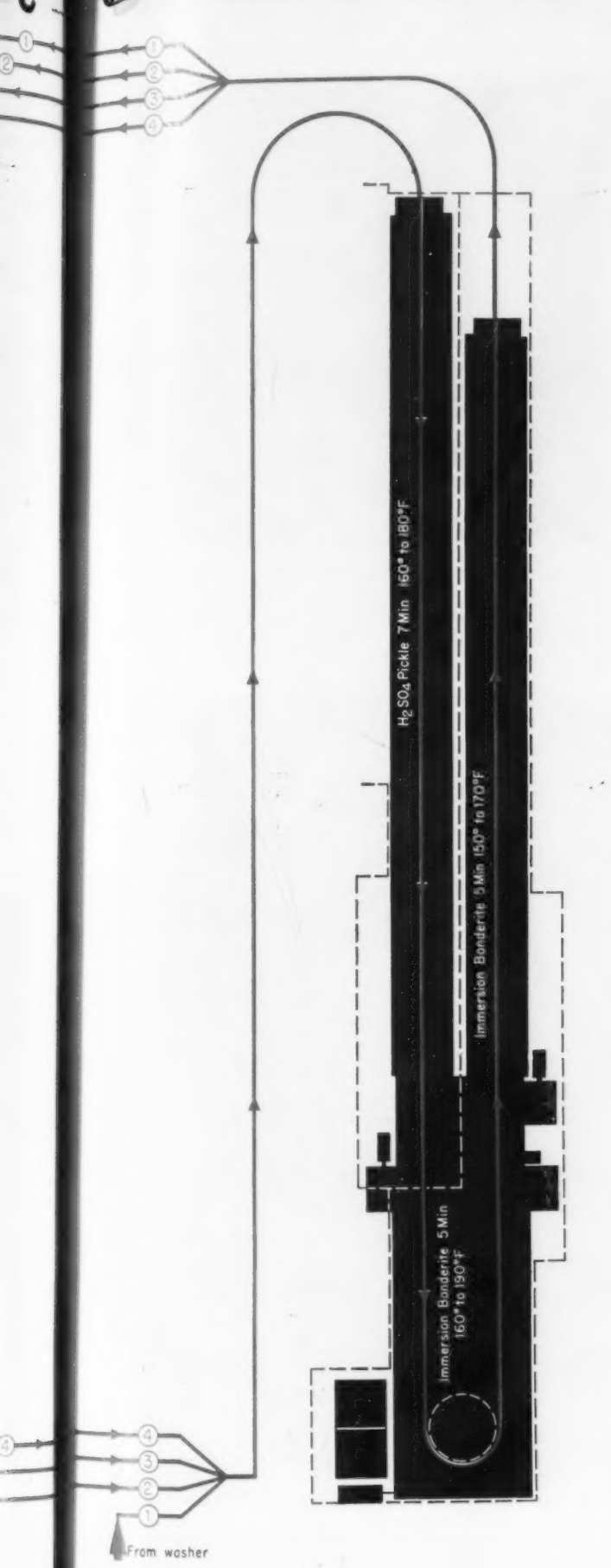


FIG. 5—Plant layout of forming area, left, shows the material flow through presses and annealing furnaces. All parts must pass through phosphate-coating machine, right, four times from the first to the last cold-forming operations.

rubber-coated roller conveyer prior to reloading on racks for the second trip through the phosphate coating furnace. After again traveling through the phosphate and soap baths on the special racks described earlier, the parts are brought by overhead conveyer for unloading on a convex roller, rubber-coated conveyer for the first draw operation.

The first draw operation is performed in a 250-ton mechanical Clearing press. Reduction during this operation is 35 pct. Wall thickness is reduced to ¼ in. Simultaneously, outside diameter is decreased to 4¾ in. while length is increased to 9 11/32 in. The cup is returned to conveyer level through a curved chute, Fig. 8.

In this operation each successive piece formed in the die pushes the previous piece into a wire cage which eventually delivers the piece in position for loading on the conveyer. The parts are then loaded on racks for the second annealing operation.

Following a 1250°F anneal and recoating, a second draw operation is performed, again in a 250-ton Clearing mechanical press, Fig. 9. The parts are removed manually after being pushed out of the die cavity by knock-out pins.

Once again the parts must be carried through the salt bath-wash-rinse and phosphate-and-soap coating cycle prior to re-strike.

The next operation is a re-strike of the base cavity. This operation also serves to gather material at the open end which provides necessary wall thickness for the nose section. A 1000-ton Clearing press is used. Following a re-strike, parts are trimmed in a Clearing trim press. Any rough edge is milled off.

The trimmed cups are annealed to a depth of 6 in. from the top in an Ajax salt bath at 1175°F prior to nosing. Immersion time is 20 min. During heating, the high physicals of the lower portion of the projectile are preserved. To avoid confusion, this step is not shown on the flow sheet at the left.

The nosing die has a Graph-Tung graphitic steel insert. Both size and runout are carefully checked following this operation. Three points are checked. Dimensions are held within 0.005 in. total indicator reading, Fig. 10.

Finished parts are stress annealed at 900°F for 10 min. Required physical properties are 50,000 psi yield strength min and 10 pct elongation.

The final operation is to thread the base and

FIG. 6—During the initial cold-forming operation, a 5 3/32-in. diam cup is formed. Following this operation, wall thickness is ½ in. The base thickness is approximately 9/16 in.

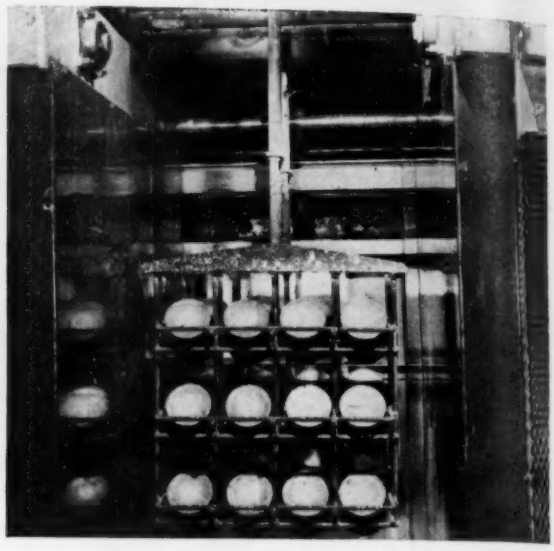


FIG. 7—Special racks are used to convey a batch of parts through two Ajax salt baths. Parts move through the baths automatically on conveyors which eliminate all manual handling.

FIG. 8—The first draw operation is performed in a 250-ton Clearing mechanical press. Reduction is 35 pct. Cups are returned to conveyer level through the chutes shown in the foreground.

FIG. 9—Floor conveyers employed by Pontiac are rubber-coated and have concave rollers. In this photograph, parts are shown moving toward the press for the second draw operation.

the nose. There is no machining inside the cavity of the projectile.

While the present operation at Pontiac has not attained sufficient volume to warrant complete automation, this can be accomplished without major changes in equipment or layout.

Through the addition of several salt bath units and minor revisions in layout and conveyers, a substantial increase in capacity will be available.

The belief is widely held in Detroit that cold extrusion will some day displace many hot forging operation in the automobile industry. Parts that might be cold extruded by the auto industry includes rear axle pinion shafts, transmission shafts and a wide range of gear blanks.

Three-dimensional "Visual" models and layout templates on previous pages furnished by Visual Planning Equipment Co., Inc., Oakmont, Pa.

FIG. 10—Dimensions must be held very closely during all operations. Both size and runout are carefully checked. As-extruded finish is excellent.

Automatic Handling of Smaller Pieces PAYS OFF IN STAMPING

◆ **Efforts to reduce costs are now focussing greater attention on the automatic handling of smaller pieces . . . Until now, automation in stamping plants has been most strikingly applied to the production of large parts.**

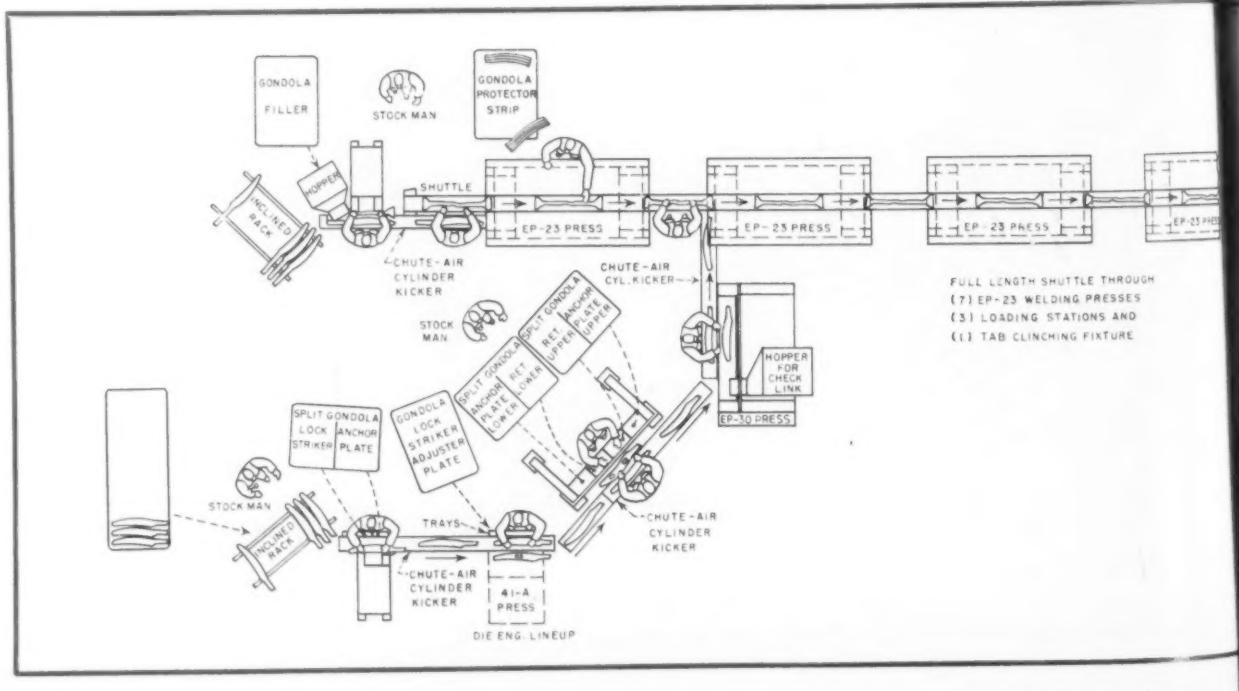
◆ **Much can be done in this direction if sufficient volume exists . . . Press welding and assembly of automobile center pillars are performed on an automated line at Fisher Body's Hamilton, O., plant . . . Over 85 pct of the smaller presses are equipped with some type of automatic-handling device.**

By E. C. Beaudet
Machinery Editor

◆ HIGHER PRODUCTION RATES, lower costs and reduced operating hazards are obtained at the Hamilton, O. stamping plant of General Motors Corp.'s Fisher Body Div. through the use of hundreds of mechanical feeding, unloading and positioning devices.

Of the more than 200 big presses in the plant over 90 pct are equipped with some kind of automatic-handling device including iron hands, sheet loaders, tip-up loaders, pusher-type loaders, shovel unloaders, kickers chutes, and transfer shuttles. Installation of these devices in many cases required reworking the dies to permit the shedding of scrap and stampings and make room for kickers and lifters.

Along with the automation of larger units, however, considerable attention has been given automatic handling on portable-type presses under 48 in. About 85 pct of the dies run in these presses are equipped with pusher, index



and magazine feeds, air ejectors and blowoffs, slide and gravity feeds, and spring knockouts. Dies not so equipped are fed with tongs, vacuum stick feeders hooks or special tools to keep operators hands ont of the danger zone of dies and fixtures.

Although automation in stamping plants is mostly thought of in terms of larger parts, efforts to reduce costs have focussed greater attention on the automatic handling of smaller pieces where a large enough volume is required. An example of this is found at the Hamilton plant where automation has been applied to the press welding and assembly of the automobile center pillars. While the equipment involved is costly it does illustrate what can be done in the way of automatically handling smaller high-volume parts.

In the welding and assembly of the right-hand center pillar various work-handling devices are used. At the start of the line, see Fig. 1, panels are fed onto a gravity slide and carried to a single-head projection welder where a small reinforcement is added. After the welding cycle is completed, an air cylinder-operated lifter raises the panel into position for transportation by a line shuttle to a welding press where another reinforcement is applied.

As the line shuttel carries the outer panel from the welding press, an outer panel reinforcement is joined to it at this point. The outer panel reinforcement which had previously been through several welding and assembly welding operations, shown in Fig. 1, is then placed in the outer panel and the assembly is carried by the shuttle through six more welding presses set in line. Between the fourth and fifth welding press an inner panel reinforcement is inserted into the assembly by an operator.

After the assembly has passed through the welding presses the line shuttle carries them into a tab-bending device. This operation, which automatically bends over tabs to hold the inner panel and trim sticks in place, was formerly done by several operators. When the tab-bending operation is completed the shuttle then retracts and the parts fall onto a gravity slide where they are loaded onto trucks for transportation to shipping platforms.

Safety switches protect equipment

On lines formerly handling this assembly 2 or more operators were required on five of the seven welding presses which now transfer the work automatically from station to station. The line shuttle is hydraulically driven, with the drive unit located between the third and fourth press in the line. At each of the welding presses positive-solenoid stops locate the piece in the exact index position. Pillars are picked up from the transfer rails by the platen of the press and the lower electrode and taken up into welding position. After welding the platen retracts and releases the part to the transfer shuttle where it is carried to the next operation.

On automatic operation, safety switches at each of the presses automatically stop the line if a piece sticks on upperelectrodes, thus protecting the press and dies from damage. The front and back ends of the line are shown in

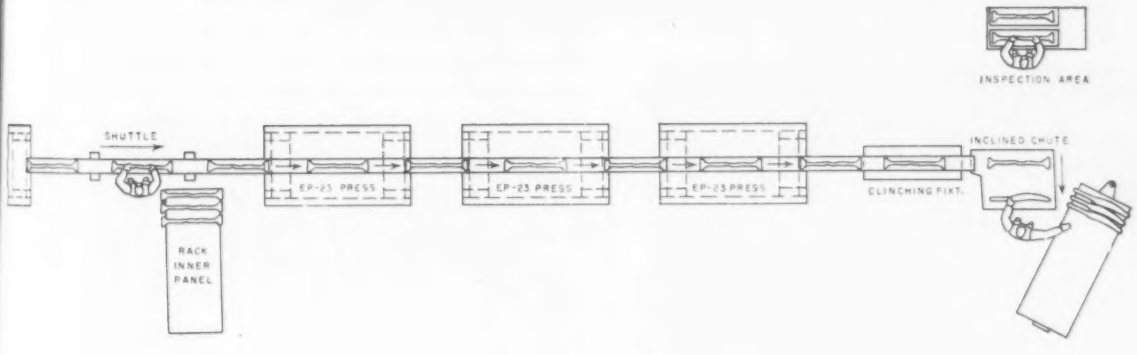


FIG. 1—Diagram of right center pillar line shows line-up of equipment used in this operation. The center pillar assembly is carried through five of the presses automatically with no operator assistance required. At lower left the equipment used for welding and assembly of the outer panel reinforcement is shown leading into the main press line between the first and second EP 23 welding presses.

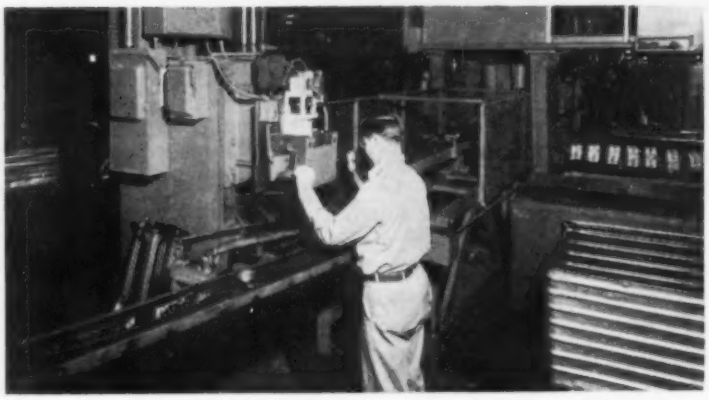


FIG. 2—At the start of the center pillar line a small reinforcement is welded to the panel by a single-head projection welder. Air cylinder-operated lifters raise the panel into position for transfer by the line shuttle seen to the rear of the operator.

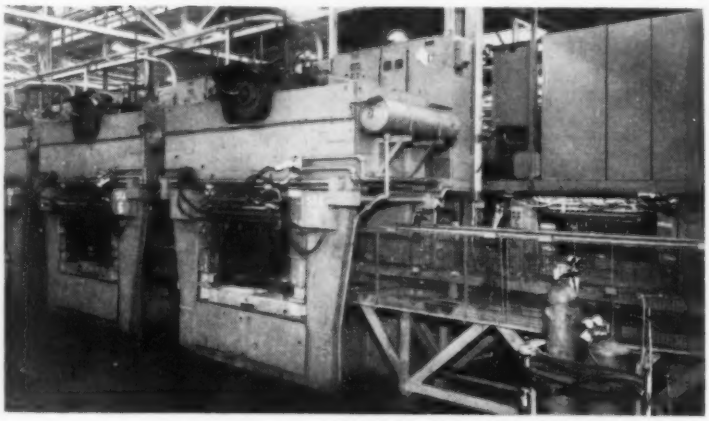


FIG. 3—Rear view of the center pillar line shows the last three welding presses in the line. Five of these presses run automatically. Inner reinforcements are loaded into assembly at press, left. Shuttle for moving parts through presses is covered by wire screens for protection.

FIG. 4—An 8-station indexing fixture permits two operators on one single-head projection welder to equal production of four men operating 4 welders.

Figs. 2 and 3. Automatic handling of the parts on this line has considerably increased center-pillar production.

Elsewhere in the plant materials handling devices have been used to solve a number of different handling problems and increase production. Greater production per square foot of floor space is obtained on one small part through the use of a rotary indexing fixture. Two men operating a single-head Federal projection welder, see Fig. 4, equal the production of four men feeding four individual projection welders by means of an 8-station indexing-welding table. In welding the hinge to a gas tank cover, a gravity slide hopper feeds hinges to the welder. One operator places covers on the welding fixtures and the other inserts the hinge part.

The assemblies are then indexed around to the welding head. After the assembly is welded the finished parts are ejected by a latch lifter operating off a cam in front of the welding head. The ejected parts drop onto a belt conveyer and are carried to an assembly station where operators insert springs into the assemblies. The assemblies then continue on the conveyer to a packing station where they are placed in cartons for shipment.

Scrap handling can be cut

Scrap handling in a large volume stamping operation is a major problem which can be greatly reduced by proper application of good materials handling principles. In the Hamilton plant production of a variety of small stampings is grouped around a centrally-located belt conveyer. On each side of the conveyer six Niagara blanking presses utilize the scrap from larger stamped parts. While the finished parts are air-ejected onto inclined conveyers, press operators hand feed the scrap onto a 60-ft belt conveyer which carries it into a chute leading below floor level. It is discharged from the chute into tubs which are carried by monorail to a scrap baler for movement out of the plant.

In another small part operation cross bar reinforcements for the trunk floor are produced at a high rate by the use of gravity feeds, air ejectors and conveyers. The parts are flanged and formed on 2 inclined presses.

Dies in these presses have a gravity slide feed, completely basket guarded, with an air blowoff to eject the part. After the forming operation, the piece is dropped through the horn of the press onto an inclined-belt conveyer. The conveyer carries it to a gravity-feed hopper which positions it in front of the second press operator. The piece is again gravity fed, flanged and air-ejected through the press onto an inclined conveyer which carries the finished piece to a 4-wheeled tub for transport to final

assembly. Alternate hand feeding used on these operations adds to increased output.

A combination of Iron Hands, gravity feeds and belt conveyers effectively reduce handling in the production of small side bar components for an automobile floor pan. In five operations, 92 ½x48-in presses rough trim, form and spank, form and flange, and trim and pierce the piece. Air cylinder-operated Iron Hands remove the panels from the dies after each operation.

Between presses, parts removed by Iron Hands are dropped on gravity feed chutes where they are transported to the next press and tong loaded. At each of the trimming presses, scrap shed from dies is carried to scrap bins by belt conveyers. At the final operation, shown in Fig. 5, the Iron Hand drops the finished piece onto a belt conveyer which carries it to a storage bin. Production of this piece has been raised with a more efficient use of personnel.

The large number of cage-type small die guards used in the plant presented storage difficulties which were overcome by overhead conveyers. Storage of these guards on wooden-tiered tables consumed a considerable amount of floor space and subjected them to damage when closely packed together. Locating the proper guard for a certain die was troublesome causing much time to be wasted.

In the present storage method, die guards are hooked on a monorail conveyer, see Fig. 6. Numbers on each guard identify it with the die it is used with. When a certain guard is needed all an operator need do is move the conveyer until the required guard reaches floor level and is lifted off.

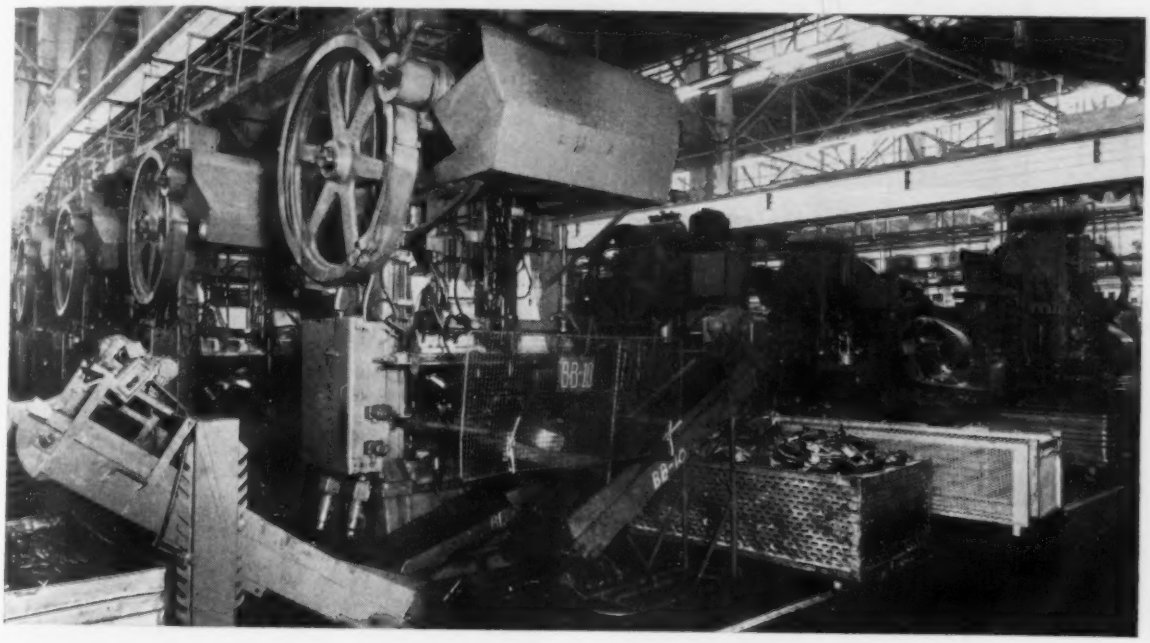


FIG. 5—Iron Hands and belt conveyers reduce handling in the production of small components. Gravity feed chutes are used between presses. The Iron Hands have boosted output, allow better use of manpower.

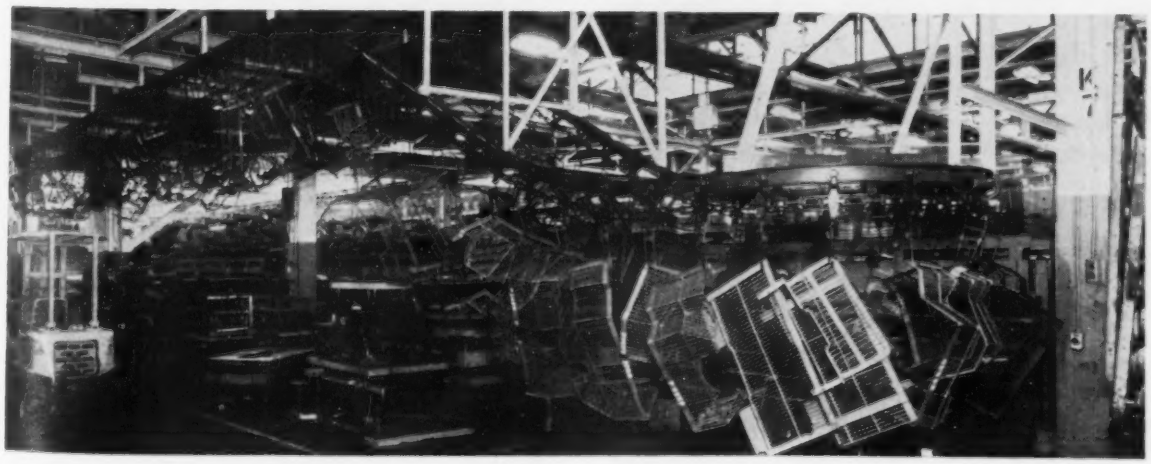
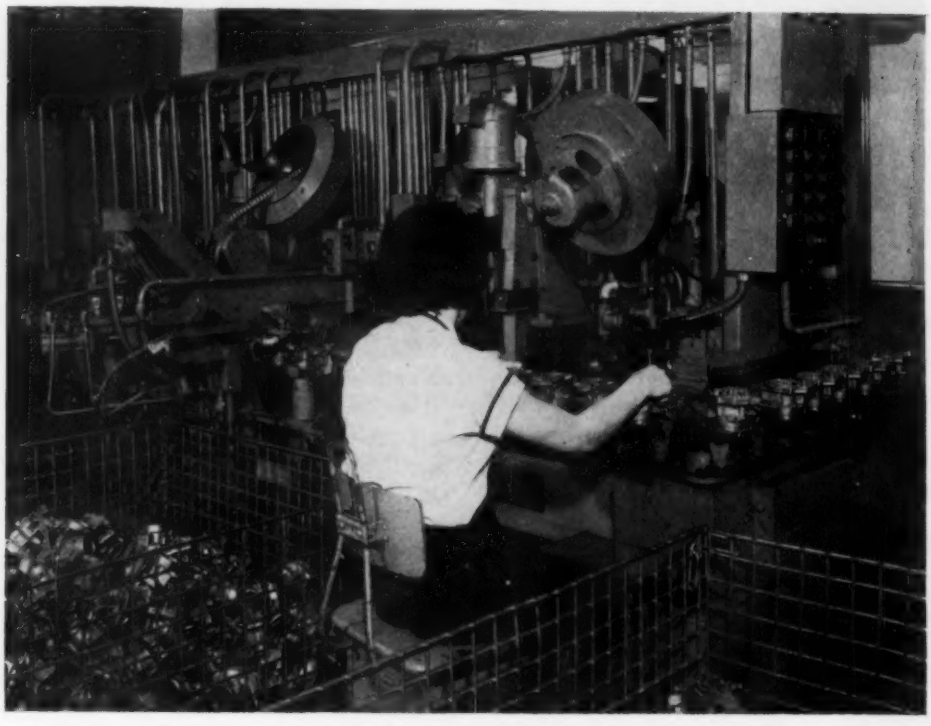


FIG. 6—Overhead monorail conveyers are used for storing die guards for small presses. System increased floor space and decreased die-guard maintenance. Numbers on each guard show die it is used with.



SPECIAL-PURPOSE machine automatically assembles and inspects small carburetor parts. Its 65 floating-type carriers go through nine work stations, eight inspection stations.

Automatic Machine ASSEMBLES, INSPECTS SMALL PARTS

By J. J. Obrzut
Associate Editor

◆ Eight small parts of carburetor air-horn assembly are automatically assembled and checked for location, position and tolerance in a specially-designed machine . . . Assemblies travel through nine work stations and eight inspection stations on 65 floating-type carriers.

◆ Safety devices are used throughout machine . . . Failure of operator, machine or assembly automatically stops the machine.

◆ All operations can be controlled individually or simultaneously from master panel . . . Indicator lights not only register faults, but locate them.

◆ THOUSANDS OF SMALL PARTS are handled hourly on the carburetor assembly lines at the Rochester Products Div. plant of General Motors Corp., Rochester, N. Y. Each must be accurately assembled and carefully inspected for location, position and tolerance before a carburetor assembly can be moved along the line. Such assembly lines are necessarily long and proper timing of each operation is essential for optimum production.

To shorten the lines and step up the present high production rate, Rochester engineers cooperated with the Process Development Section of General Motors to design and build a special-purpose machine to automatically assemble air-horn assemblies of carburetors. The machine base is of the floating-carrier indexing type, adapted from an original design by the Delco-Remy Div.

Two parallel conveyer chains, traveling in a horizontal plane around the machine, have 65 indexing carriers spaced on 5-in. centers. These carriers receive and hold the air-horn assem-

blies as they traverse nine assembly stations and eight inspection stations. The carriers ride on four pins of conveyer chain attachments, providing enough freedom of movement for accurate alignment of assemblies at the various stations.

Four sprockets mounted on vertical shafts, one at each corner of the indexing base, move the conveyer chain around the machine. One of these is a drive sprocket and the remaining three are idlers. The machine is powered by a ½-hp motor drive and gear-reduction assembly with a 97.5 to 1 ratio. Both units are integral parts of the indexing base.

All operations are timed by a slotted timing cam. Three dogs, spaced at 120° intervals around the cam, successively engage the cam at each third of a turn. The cam rotates once for every three rotations of the drive mechanism so that the indexing interval is one-third as long as the interval for assembly and inspection operations.

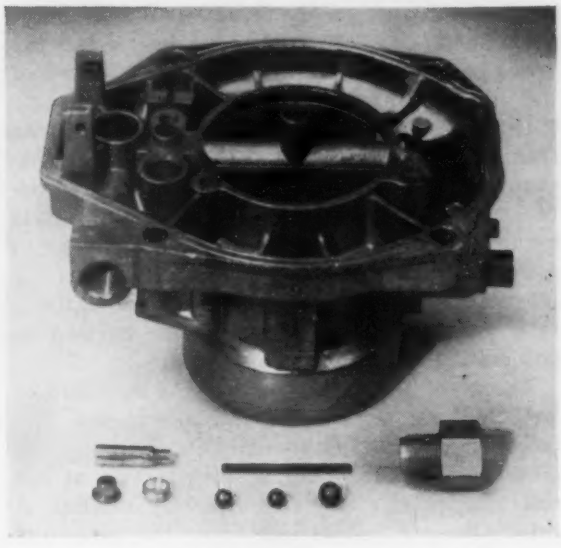
Safety features are incorporated into the design of the machine at every possible point. An important component of the indexing base is a safety clutch which disengages at the slightest overloading of the machine. If tools or clamps fail to retract before the start of the next indexing cycle, a safety circuit at the work station shuts off the machine. In the event a safety circuit fails to function properly, a pull on an emergency cord installed within easy reach of the operator shuts off all circuits.

Lights signal trouble spots

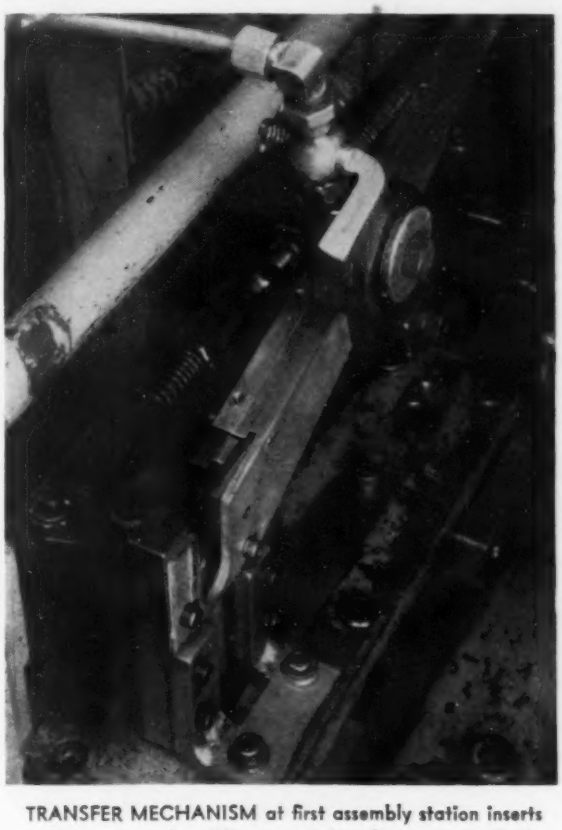
Machine operations can be controlled individually or simultaneously from a master panel. Indicator lights on the panel register and locate faults as they occur. Another series of indicator lights registers the location of a tool or clamp that fails to retract. In addition to the master control panel, each assembly and inspection station has an individual set of controls.

The machine can assemble any one of five or six different air-horn assemblies. It currently assembles eight small parts into the air-horn assembly of Chevrolet automatic choke-type carburetors. The air-horn shell, into which the small parts are fitted, is an intricately-shaped zinc diecasting with a Dichromate finish for corrosion resistance.

At the first assembly station, a thin rectangular piece of steel, called a diffuser, is inserted into the idle passage of the air-horn shell. The pieces are fed from a rotary hopper to a transfer mechanism by means of an inclined and slotted track. About midway down the track, an escape mechanism, timed with the indexing cycle of the machine, feeds the diffusers one at



EIGHT SMALL PARTS are fitted into the air-horn shell of a Chevrolet automatic choke-type carburetor. Each is checked for location, position and tolerance after assembly with a probe and limit switch.

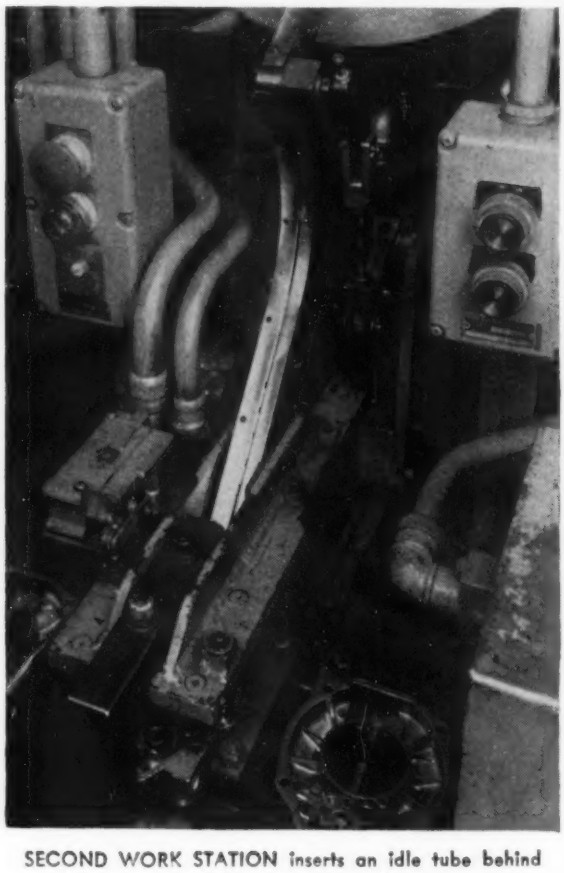


TRANSFER MECHANISM at first assembly station inserts a thin rectangular diffuser into the idle passage of air-horn assembly. Diffusers are stacked horizontally but are turned 90° in a spiral passage before assembly. An inspector checks their position.

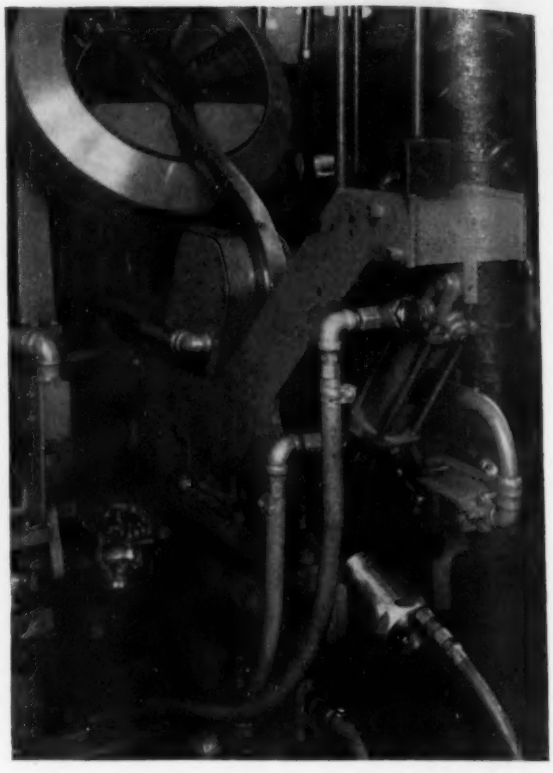
a time to prevent overloading the transfer mechanism. An air-operated vibrator at the lower end of the track assures positive feed of the diffusers into the transfer mechanism.

Diffusers are stacked horizontally in the transfer mechanism and fed into a spiral passage from the bottom of the stack. As the diffuser passes through the spiral passage, it is turned 90° and assembled in the idle passage in a vertical position. Because of the relatively inaccessible location of the diffuser, no entirely satisfactory method has yet been devised to automatically check its position.

The second assembly step is the insertion of an idle tube behind the diffuser in the idle passage. The tube is about $\frac{5}{8}$ in. long and has a $\frac{1}{8}$-in. diam except for a short section at one end where the diameter is slightly smaller. A rotary hopper selects and feeds the tube onto an inclined track, the heavier end sliding down first. An escape mechanism receives the idle tube and inverts it for proper positioning in the assembly. A simple transfer mechanism inserts it through an access hole in the shell into the idle passage after it is released by the escape mechanism.



SECOND WORK STATION inserts an idle tube behind the diffuser in the idle passage through an access hole in shell. Escape mechanism near top of track receives idle tube and inverts it before it is assembled.



LAST STATION installs fuel connection into air-horn shell with an air-operated wrench. An air blast from eight tubes then clears passages of loose particles.

The assembly is then indexed to the third assembly station where a small flat-headed steel plug seals the end of the idle passage to enclose the diffuser and idle tube. Selection and positioning of the plugs is done by a rotary hopper before they slide down a grooved steel track. The transfer mechanism at this station consists of two fingers which grasp the plug and place it at the opening of the idle passage. A punch presses the plug into the opening. During the punching operation, the mechanical spring-loaded fingers open and then close, grasping another plug for the next assembly.

Part numbers are stamped on the assemblies at the fourth work station. This step is a conventional stamping operation in which a steel stamp works on an eccentric. Its operation is timed with the indexing cycle of the machine.

A short nozzle, cast into the air-horn shell, extends perpendicular to the idle passage. At the next assembly station, a small brass tapered nozzle cup is inserted into this passage and press fitted. A rotary hopper positions the nozzle cups so that the tapered end faces downward and sends them down an enclosed steel track. A transfer mechanism places them into position where a punch presses them into the nozzle. Following each assembly station is a probe and limit switch inspection point.

Technical Briefs

Engineering

MATERIALS HANDLING TIPS:

Simple equipment costs less to install, less to maintain.

American industry spends from 20 to 25 pct of each factory payroll dollar for the moving of materials from receiving dock to customer. Handling of materials does not increase the value of the product, and the entire cost of materials handling is an economic burden.

Management can achieve considerable cost reduction through a sound analysis of materials handling weaknesses within the plant. Some phases worth study include:

Simpler handling methods. At least as much time should be spent on this phase of production engineering as is spent in simplifying machining and assembly methods.

Make It Simple

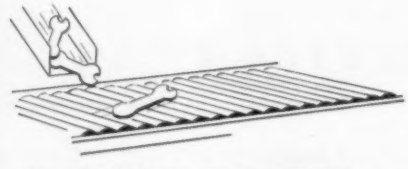
Strive for simple handling equipment mechanisms. Specify the lever, inclined plane and wheel rather than complicated "Rube Goldberg" types.

Cut frequency of handling to a minimum. Use chutes or roller conveyers where feasible.

Select containers carefully. Aim toward a minimum number of types. Durable plastic tote boxes, for example, designed to meet a broad range of requirements, are extremely economical.

Specify standard equipment wherever possible. Availability and low cost of replacement parts

SIMPLE materials handling devices cost less, require less maintenance. Strive to use basic lever, inclined plane and wheel devices.

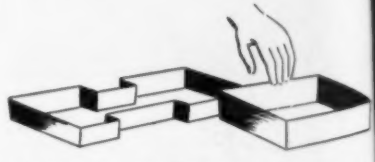


CUT FREQUENCY OF HANDLING to a minimum. Make use of chutes and roller conveyers wherever possible.

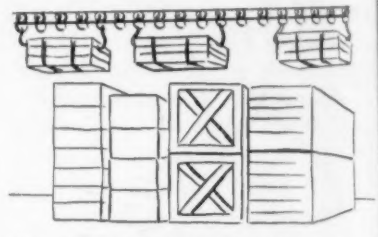
IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 171. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

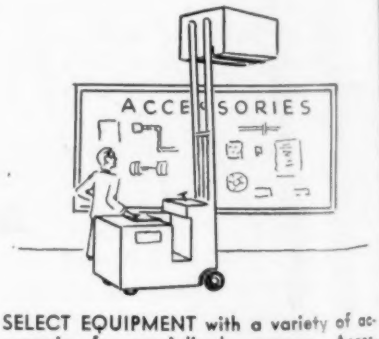
CONTAINER AND TOTE BOX selection is important. Containers should be light, durable. Cut the number of sizes to a minimum. Containers should nest.



STANDARD EQUIPMENT will speed your handling operations, save you money. Select equipment which can meet many materials handling requirements.



USE OVERHEAD CARRIERS for storage and nonproductive areas. Aisle requirements can be cut, handling simplified.



SELECT EQUIPMENT with a variety of accessories for specialized purposes. Accessories often provide a simple and less costly answer to special handling problem.

...d Production Ideas

...he major consideration in favor ... standardized materials handling ...uipment.

Select diversified equipment to ...et specific needs. Too many hi-...ts and not enough walk-abouts ...crease both initial and mainte-...nce costs.

Pallet Design Important

Study pallet designs carefully. ...exibility is required in plants ...aking diversified product lines. ...igh maintenance costs can result ...om poor designs.

Select only one type of lift truck ...wer. Problems in work assign-...ents in maintenance departments ...der union regulations can lead ... many repair delays in factories ...here both gas and electric pow-...ed trucks are in use.

Specify overhead carriers for ...orage and nonproductive areas. ...his avoids the need for trucking ...isles and reduces floor trans-...ortation equipment maintenance ...osts.

Design storage bins and shelv-...g with care. These should pro-...ide maximum ease of dispensing ...arts and materials.

Synchronize Operations

Effect production line synchro-...ization. Materials handling equip-...ent plays a most important role ...n this factor.

Award contracts intelligently. ...osts of installing materials han-...ling equipment can often be cut ...y awarding separate contracts for ...ifferent phases of the work.

Investigate carefully the cost ...avings proposed by new installa-...ions. Too often opinions are sub-...tituted for facts, and in the end ...he savings may not be effected.

Select materials handling equip-...ent having a variety of acces-...ories for many specialized pur-...poses. Such equipment often results ...n lower handling costs and im-...mediate solution of an urgent need.

E. E. SCHAFFER, author of this analysis of basic materials handling problems, is Staff Engineer of the Harold F. Howard Co., Industrial and Management Engineers, Detroit.

Turn Page

APPLIANCE ASSEMBLY:

Novel device up-ends refrigerators on assembly line.

Materials, in-process parts and assemblies are handled from receiving to shipping departments on a series of materials handling devices at the Admiral appliance plant in Galesburg, Ill.

Belt, wooden slat apron and roller conveyers, rigid arm elevator conveyers, ball caster table and interesting Down-Ender and Up-Ender mechanisms pace fast-flowing, economical production.

Two belt conveyers transport purchased parts and materials through covered bridges from the truck receiving dock to storage space on a plant mezzanine. Here a rigid arm elevator conveyer lifts insulation bales from the railroad receiving dock to mezzanine storage.

These Speed Assembly

Six wood slat apron conveyers are used for door and cabinet assembly. Other materials handling units include an assembly lines junction conveyer, ball caster table and Down-Ender; a belt conveyer across a bridge from production to shipping; and an Up-Ender and shipping room conveyer. Twelve of the conveyers are built by E. W. Buschman Co., Cincinnati.

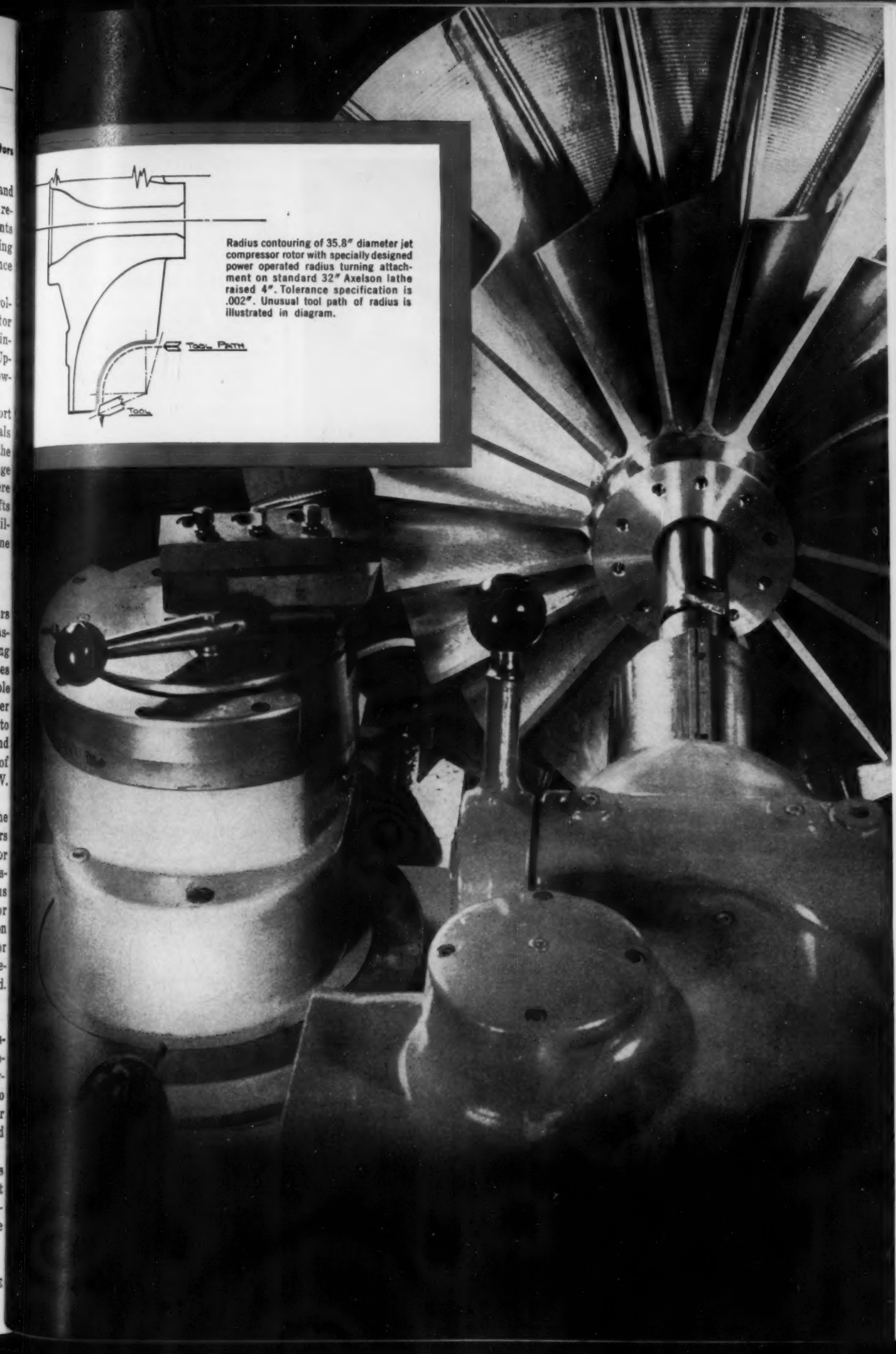
An interesting feature of the various wood slat apron conveyers is the padded fixtures provided for holding the door and cabinet assemblies in the most advantageous position for assembly. The door assembly line has padded rests on which the porcelain finished door is placed, front down, while interior trim, shelves, etc., are added.

Travel on Crate Bases

A major part of the cabinet assembly is performed with the cabinet back-down on the slat conveyer. The cabinet is then raised to normal position on the conveyer and door and other units added and checked.

Two packaging and crating lines lead from final assembly and test rooms. Standard refrigerator production and Dual-Temp units ride

Turn to Page 246



Radius contouring of 35.8" diameter jet compressor rotor with specially designed power operated radius turning attachment on standard 32" Axelson lathe raised 4". Tolerance specification is .002". Unusual tool path of radius is illustrated in diagram.

separated on the two conveyers. The refrigerators travel on crate bases installed on the line.

After final testing, cartons containing smaller components are stowed in the interior of each unit, the door closed and banded and the rest of the shipping container put in place.

For transportation over a bridge belt conveyer to the shipping and storage area, the refrigerators must be placed back-side-down. This operation is performed by a Buschman Down-Ender which receives the unit standing up and then lowers it to a flat position.

INCENTIVE PLANS:

Human relations, profit, and efficiency stressed in plan.

Better employee relations, improved efficiency and company profit should be guides in establishing an incentive plan for materials handling operations. Points in a multi-goaled plan were outlined recently by Thad G. Lutz, supervising engineer of Inland Steel Co. at a recent meeting of the Chicago chapter of the American Materials Handling Society.

Here Are Suggestions

1. A plan should lessen employee relations problems.
2. Men should be fitted for their jobs—by selection or training.
3. Earnings should vary with effort.
4. Plan should lower costs and improve company earnings.
5. Jobs should be standardized before a plan is adopted.
6. A method study should be made.
7. Plan should be understood by all workers.

Importance of good employee relations, in streamlining materials handling operations was stressed by Mr. Lutz who recommended that 85 pct of time spent on a plan should be devoted to problems directly involving people.

An efficient plan should reduce costs by 25 pct, Mr. Lutz estimated, pointing out that on non-bonus jobs production is usually only about 70 pct efficient.

Turn to Page 248

Enter this Lyon Den with Confidence

There are two big reasons why your Lyon Steel Equipment Dealer is a good man to know.

First, a highly diversified line of more than 1500 standard Lyon items enables him to meet the varying needs of business, industry and institutions — *better.* (A very few typical Lyon products are shown below.)

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- Economy Locker Racks
- New Freedom Kitchens
- Toolroom Equipment
- Wood Working Benches
- Display Equipment
- Flat Drawer Files
- Revolving Bins
- Hanging Cabinets
- Filing Cabinets
- Folding Chairs
- Work Benches
- Bench Drawers
- Service Carts
- Sorting Files
- Drawer Units
- Hopper Bins
- Tool Stands
- Shop Boxes
- Tool Trays
- Shop Desks

BOOM CONVEYER:

Unit on wheels crosses railroad tra to link buildings.

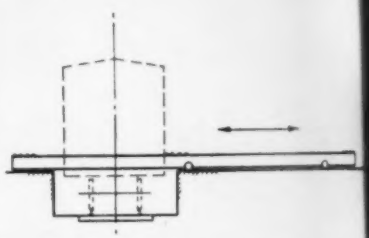
An unusual boom conveyer in stalled at a midwest printing plan extends across a railroad sidin between two buildings—yet ma be withdrawn to permit passage o freight cars.

In this installation it was de sired to move heavy packages fro the packing room directly into a adjacent warehouse.

Watch Out For Cars

A railroad siding on whic freight cars are occasionall switched passes between thes buildings. The conveyer boom wa designed so it could be withdraw to permit passage of the cars.

This live roller boom is equippe with fully enclosed drive mechan ism and the entire mechanism is self-contained unit. An enclosur protects packages between build ings. This enclosure rides th conveyer frame and is an integra part of the structure. A hinge door is opened as the packages pas along the conveyer.



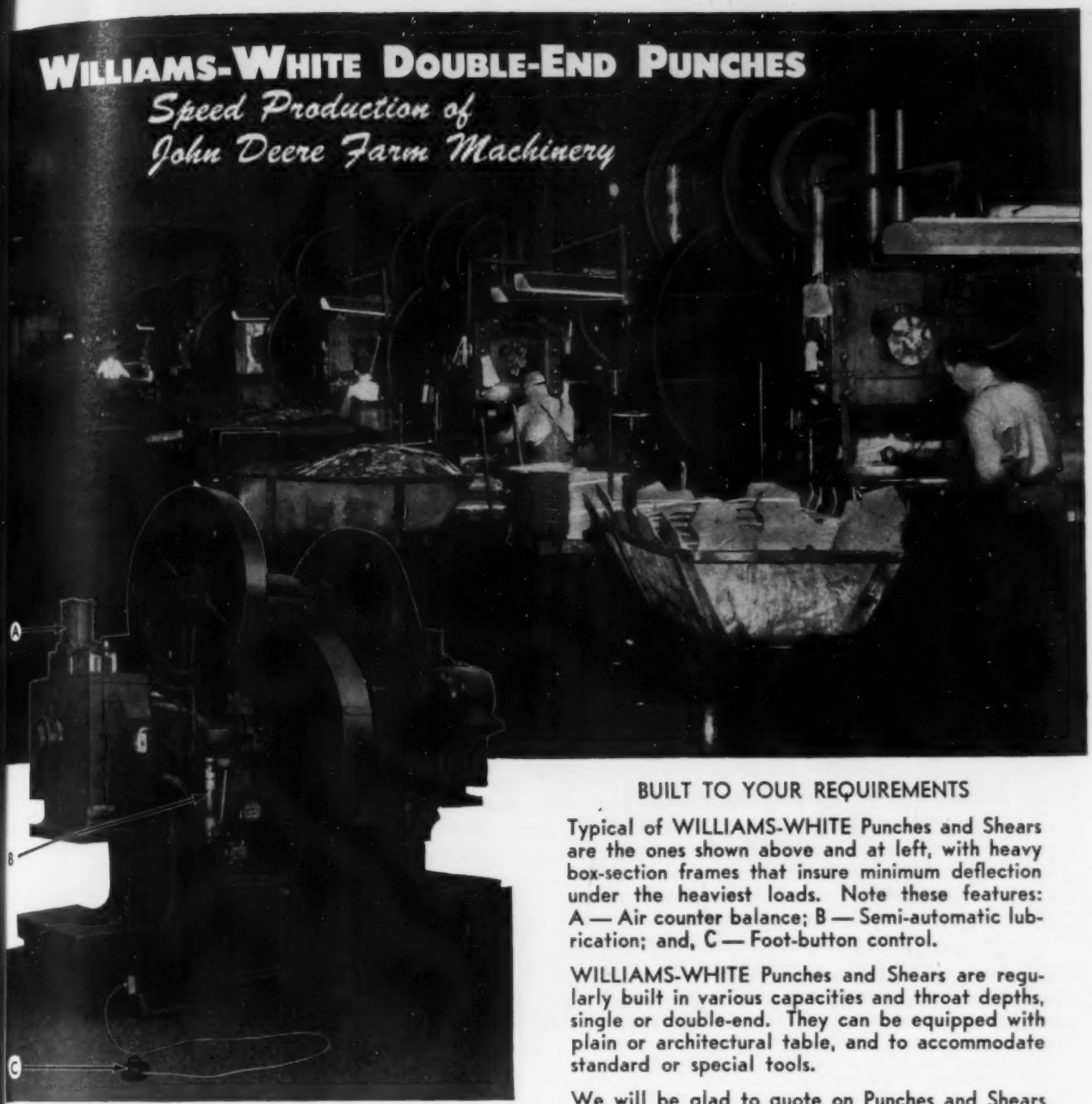
BOOM CONVEYER can be rolled acros railroad track separating two buildings.

PROTECTION from weather is provided by shed and roof which rolls with the boom conveyer.

Turn to Page 250

WILLIAMS-WHITE DOUBLE-END PUNCHES

Speed Production of John Deere Farm Machinery



BUILT TO YOUR REQUIREMENTS

Typical of WILLIAMS-WHITE Punches and Shears are the ones shown above and at left, with heavy box-section frames that insure minimum deflection under the heaviest loads. Note these features: A — Air counter balance; B — Semi-automatic lubrication; and, C — Foot-button control.

WILLIAMS-WHITE Punches and Shears are regularly built in various capacities and throat depths, single or double-end. They can be equipped with plain or architectural table, and to accommodate standard or special tools.

We will be glad to quote on Punches and Shears for special use, in which ram and table construction, die space and stroke meet your particular specifications. See our representative nearest you or write us direct. No obligation on your part, of course.

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MOLINE, ILLINOIS

—Technical Briefs—

RAW MATERIALS:

Automatic blast furnace charging used at Belgian steelworks.

Higher production at lower cost has resulted from installation of automated conveyer-type blast furnace charging equipment at the Seraing, Belgium, steelworks of Societe Anonyme John Cockerill.

One of the oldest steelworks (1817) in Europe, the site is highly congested. Erection of two of three planned new furnaces presented difficulties in feed line arrangements. Normal aerial ropeway or skip-hoist charging could not be used for lack of space.

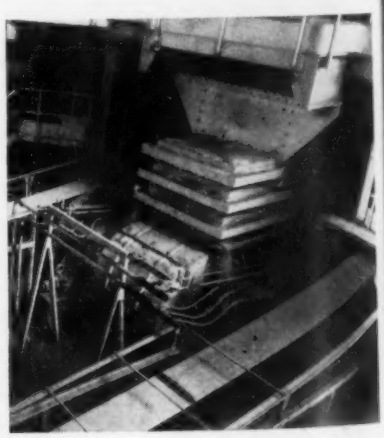
Many Ore Sources

Ore comes to Seraing by rail from Luxembourg, France, Belgium, and Sweden. The ore is deposited in a wagon tippler which —despite unfavorable American experience—functions well with 60-ton hopper wagons.

Primary and secondary crushers are fed with ore through vibrating screens. Material is then taken either to bunkers or directly to the main screening plant for separation into ores and fines.

Automatic Control Starts

Fines are agglomerated in a sintering plant. Ores and coke are stored in hoppers, near the blast furnaces. From this point, charging of each furnace is automati-



PRIMARY ORE CRUSHER used at the Seraing, Belgium, steelworks where two new blast furnaces were recently installed.

cally controlled by a new timing arrangement.

Heart of the timing device is a cam controller, actuated through clutches by a selsyn. Electrical impulses come from a transmitter roller-driven from the 1-in. thick, 220-yard, conveyer belt. Belt speed is 3 fps. The belt carries 1200 tons of ore and 400 tons of coke every 24 hr to charge the 187-ft furnace.

Coke is released from the hoppers by vibrators. Electro-magnets powered by rectified alternating current operate on spring-and-gravity balanced screens to set up mechanical resonance and move the coke forward. Weighers control the stopping of the vibrators.

Take Ore From Hoppers

Ore is taken from the hoppers by a manually controlled, electrically operated scalecar. Ores are deposited on hoppers beneath the scalecar rails. A steel plate conveyer (actuated by the central timing device) delivers the charges required to the conveyer belt.

Once the belt under the hopper line and the inclined belt running up to the furnace top have been started, the sequence of charging the furnace can be carried out automatically.

By operating switches, various sequences of coke and ore charges can be set up for either furnace. The timers then take charge.

Control of the charging operation requires only two men, one on the scalecar, and the other the operator in the air-conditioned control room.

Control Pays Off

Through use of conveyers and automatic controls, production level and quality have improved substantially.

Turn Page

WAGON TIPPLER, size 60 tons, is used to handle ores received from Luxembourg, France, Belgium and Sweden.

CONVEYER, distributor and traveling crane are used to move ores from hoppers to furnaces. Conveyor system is electrically controlled.

WAREHOUSING:

Storage of bar and tube stock simplified with special unit.

Putting bar and tube stock into the bins of a warehouse is a slow job requiring considerable manual labor. Now a specially designed unit takes much of the labor out of this job by making it simpler to slide stock into the pigeonhole type bin. Stock is moved at bin-height and does not have to be picked piece by piece from the floor.

The straddle type JackStacker was designed by Lewis-Shepard, Watertown, Mass. It incorporates a detachable roller platform with an integral catwalk by means of which the operator is raised or lowered to load or unload storage racks.

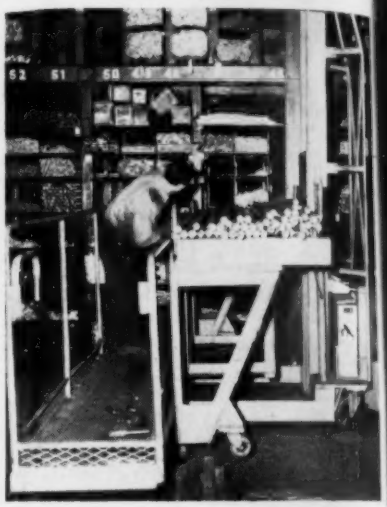
Simple Controls

Capable of handling 24-ft steel bars weighing to 6000 lb, the machine has a 120-in. elevation with a 32-in. load length. Dual electric fingertip controls allow selective operation from catwalk or standard control handle.

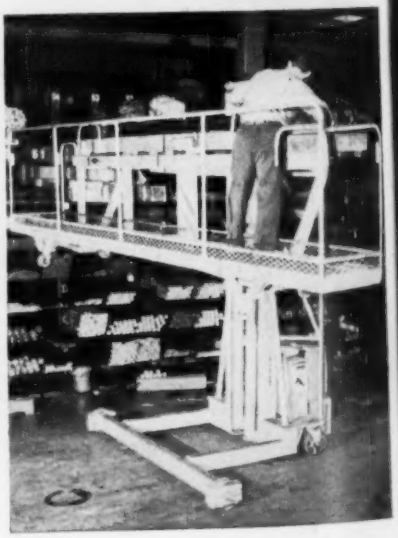
Constant Traction

The catwalk is built on 10 stabilizing casters and can be moved by hand for ease of attachment and storage. Because roller platform and catwalk are detachable, the unit can also be used to handle miscellaneous skid loads with its fixed carriage forks.

Designed with an articulated frame, constant traction effort is



BAR STOCK can be easily pushed into pigeon hole bins, using specially designed elevating unit.



STACKING UNIT raises 120 in. to easily reach high bins and simplify storage of round stock.

Turn to Page 254

assured even over grades and u even floor conditions. This give four-point stability to the lo carrying unit. Tubular reinforcin of mast adds rigidity at high lift thereby assuring maximum safet for operator.

A heavy-duty hydraulic system i combined with a GE high speed lift motor.

Rigid tubular guard rails with expanded metal foot guards assure operator safety. An inter-coupling safety lock between JackStacker and roller platform prevents acci- dental operation from catwalk— the machine does not operate unless catwalk is properly engaged.

CONVEYER MAINTENANCE:

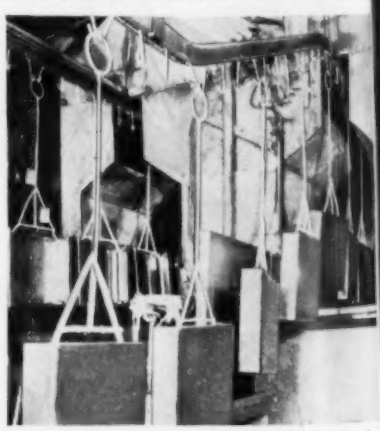
Fast paint stripper speeds cleanin of handling equipment.

Stripping paint from conveyer hooks, hangers and other conveyer line handling equipment, as well as paint rejects, can be done on a production basis in conveyer line operation with the use of new paint stripping chemicals.

Conveyer line hangers and other parts are run through a tank of a one-step stripper at a given point. Prior to reaching this stage, fin- ished work pieces are removed and at this point, accumulated paint re- jects can be placed on the line to be stripped along with equipment.

Tests indicate savings up to 90 pct in stripping time.

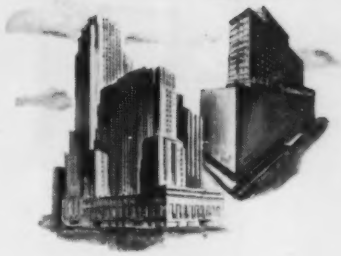
The new high speed, one-step stripper, developed by Klem Chemi- cals, Inc., Dearborn, Mich., can also be applied by production spray methods if desired.



STRIPPING PAINT from conveyer hooks, hangers and other equipment is simplified by routing line through stripping bath.

Turn to Page 256

WASHINGTON
Wardman Park



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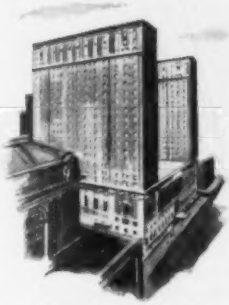
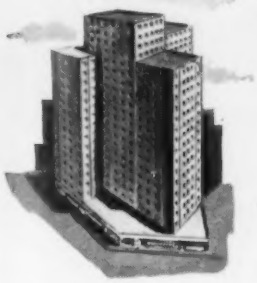
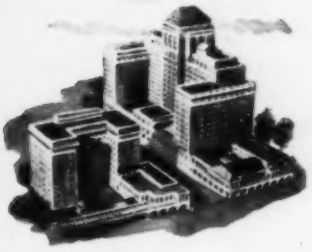


NEW YORK
Hotel Commodore

BOSTON
Parker House



PITTSBURGH
Carlton House



ATLANTIC CITY
Chalfonte-Haddon Hall

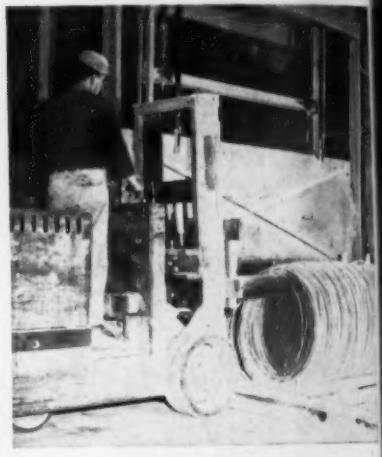
—Technical Briefs—

WIRE HANDLING:

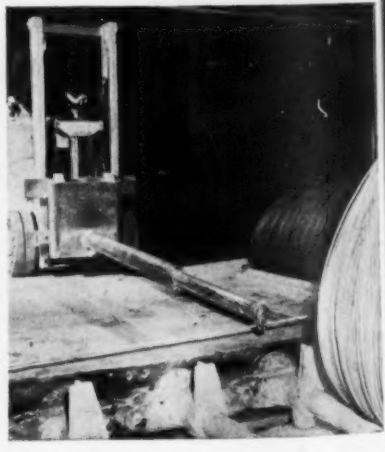
Collapsible ram simplifies movement of coiled wire in mill.

A special fork truck wire handling attachment has permitted an eastern manufacturer of steel wire to substantially reduce the time required to transfer coiled wire from production to storage areas. Two 4000-lb capacity fork trucks equipped are used. A collapsible ram assembly, extendable to 107½ in. replaces the standard fork assembly.

In the past, buggies loaded with the coils of wire were pushed mechanically through the baking ovens and then gravity-fed to the storage areas. Now, two Yak trucks, marketed by the Mercury Mfg. Co., Chicago, transfer the coils from baking oven to storage



HANDLING WIRE in coils before and after heat treat operation has been simplified with ram mounted on Mercury Yak truck.



COLLAPSIBLE RAM hooks on wire, opens as truck backs away. Operator picks up load, then compresses coil wire load and ram by butting against wood-lined steel column.

Turn to Page 258

Acme Steel Strapping Insures S.A. *(Safe Arrival)*

Saves time and trouble palletizing automobile bumpers

BUMPER-TO-BUMPER. Each multi-bumper unit is securely bound with Acme Steel Strapping, all ready to be moved by fork lift truck.

Shipping hundreds of awkward-to-pack, hard-to-handle automobile bumpers to auto assembly plants presents no problem to United States Spring & Bumper Co., Los Angeles. They quickly fasten each pallet-load of bumpers together securely with Acme Steel Strapping, making large easily-handled units.

This makes individual wrapping and loading unnecessary. And it takes only a matter of minutes to strap these bumpers onto pallets. Acme Steel Strapping saves time, money and weight, protects each pallet-load from damage and insures S. A. (Safe Arrival).

Whatever packaging problems you may have in your plant, chances are that Acme Steel Strapping or Acme Steel Stitching can solve them. Ask your Acme Steel representative. Or write to Acme Steel Products Division, Dept. IA53, Acme Steel Company, 2840 Archer Ave., Chicago 8, Illinois.

ACME STEEL CO. CHICAGO

STRAP IT . . . STITCH IT . . . SHIP IT . . . SAFELY!

ACME STEEL

area. Moving time is 5 min for each complete cycle.

Unit-loads of wire, in coils, travel through the oven in an upright position, on a conveyer belt. Upon reaching the belt-end retaining device, loads have a wire temperature of 400°F. Each load consists of seven or eight coils of wire, weighing approximately 375 lb per coil.

Ram Picks Up Load

The lift truck is moved to the side of the conveyer, where the hot coils of wire are resting, and the ram hooked onto a spring-loaded cable. As the truck backs away, the ram is extended to its full length. Spring loading the cable prevents sudden over-stressing of the cable when the ram reaches full length.

With the ram fully extended, the lift-truck is maneuvered so as to thrust the ram over the conveyer and through the center of the coils of wire. By raising the lift-fork carriage assembly, the ram is lifted and wire coils are raised clear of the conveyer belt.

When the loaded ram is clear of the conveyer, the operator butts it into a specially constructed wood-lined steel column. This collapses the ram and compresses the unit-load of wire coils. This not only reduces the length of the ram—making truck movement easier—but also reduces the inch-pound cantilever loading on the fork truck.

Turn to Page 260

"Now you got to walk from here, Mac. I ain't allowed to drive this thing up the stairs."

FLEXIBILITY:

Careful planning gives "job-shop" best return on space, equipment.

Improved parts handling is an important factor in speeding output of aircraft parts and increasing available production area, methods engineers at Ryan Aeronautical Co., San Diego, Calif. believe.

To prove their point, Ryan's engineers start with the objective of absorbing the largest volume of business which the plant's facilities can handle. In addition, factory space, tools and manpower must be used to the best economic advantage.

Savings gained through use of better machines can easily be lost in a confusing shuffle of poor parts handling, engineers point out. This is especially true where production flow is inadequate and plant layout is not matched to production needs.

Three Product Types

Ryan manufactures three basically different types of products and works as both prime and subcontractor. One section builds airplanes and big airframe structures of aluminum, such as Boeing fuselages and fuel tanks. These require large space allocations and substantial application of small hand tools.

Another fabricates stainless steel parts for jet engines which require big machine tools and furnaces to meet high precision specifications.

Still another division builds aircraft exhaust systems which must be shuttled back and forth between innumerable forming, welding, heat treating and machining operations because of the temperamental behavior of the alloys used.

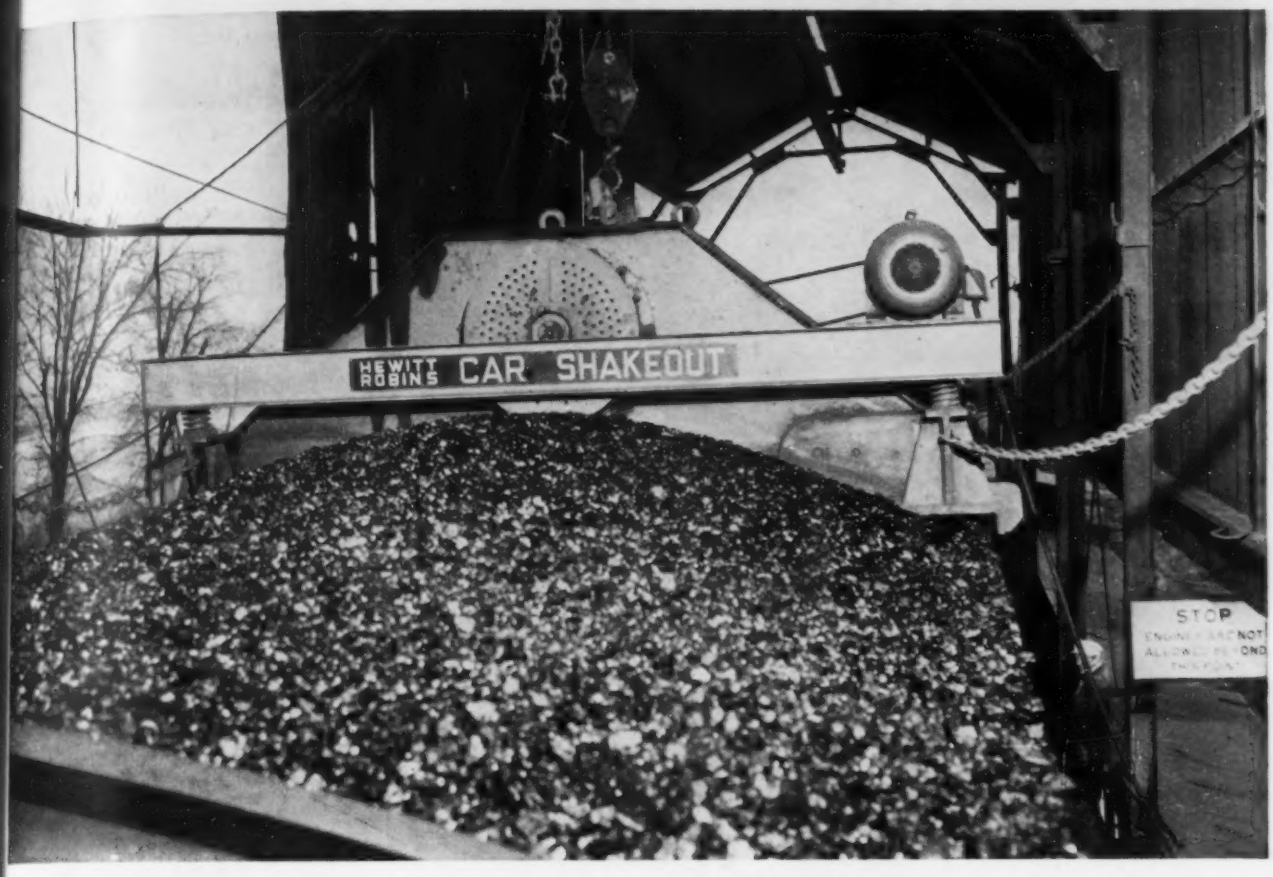
Changes Frequent

Design changes are frequent. Production runs are relatively limited and the extent of a contract cannot be forecast far into the future.

Plant layout and parts handling

Turn to Page 262

UNLOADED 3,207,708 TONS AND NEVER MISSED A DAY!



EQUIPMENT: Hewitt-Robins Heavy Duty Car Shakeout.

LOCATION: Bradford Dock of the Carbon Fuel Company, Kanawaha River, Marmet, West Virginia.

OPERATION: Unloading coal from hopper cars.

PERFORMANCE: This Hewitt-Robins Heavy Duty Car Shakeout unloaded approximately 50 cars a day, every day for 6½ years without missing a complete day . . . unloaded a total tonnage of 3,207,708 tons . . . average unloading time of 2½ minutes per car under normal conditions (even partially frozen coal unloaded in 10 minutes). During this period of operation, the Car Shakeout has never been torn down and the original shaft, bearings and vibrator assembly are still intact . . . only maintenance required was replacement of V-belts and springs.

RESULTS: The Carbon Fuel Company reports that this unit has paid for itself *many times over in man-hours saving alone.* Now only four men are needed to handle car unloading operations at the dock . . . whereas six to eight men were normally required before the Hewitt-Robins Heavy Duty Car Shakeout was installed.

For complete information about Hewitt-Robins Car Shakeouts . . . 5-ton HD (Heavy-Duty), 3½-ton GS (General Service) . . . write to Hewitt-Robins Inc., 666 Glenbrook Road, Stamford, Conn.

HEWITT HR ROBINS

Executive Offices, Stamford, Connecticut

DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam
FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale, Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • EXPORT DEPARTMENT: New York City.

methods are designed for flexibility and streamlined to meet each type of fabrication.

Handling methods are, in order of increasing efficiency:

(1) Stock boxes and pallets
(2) Mobile dollies and special racks
(3) Conveyers on floor tracks
(4) Roller conveyers and monorails
(5) Powered conveyer systems
(6) Special machine loading devices

Three Basic Factors

To attain maximum dollar return per square foot of floor space, three basic questions relative to each project are considered:

(1) Rate of production—how fast must the parts be made.

(2) Production potential—what is the life expectancy of the program.

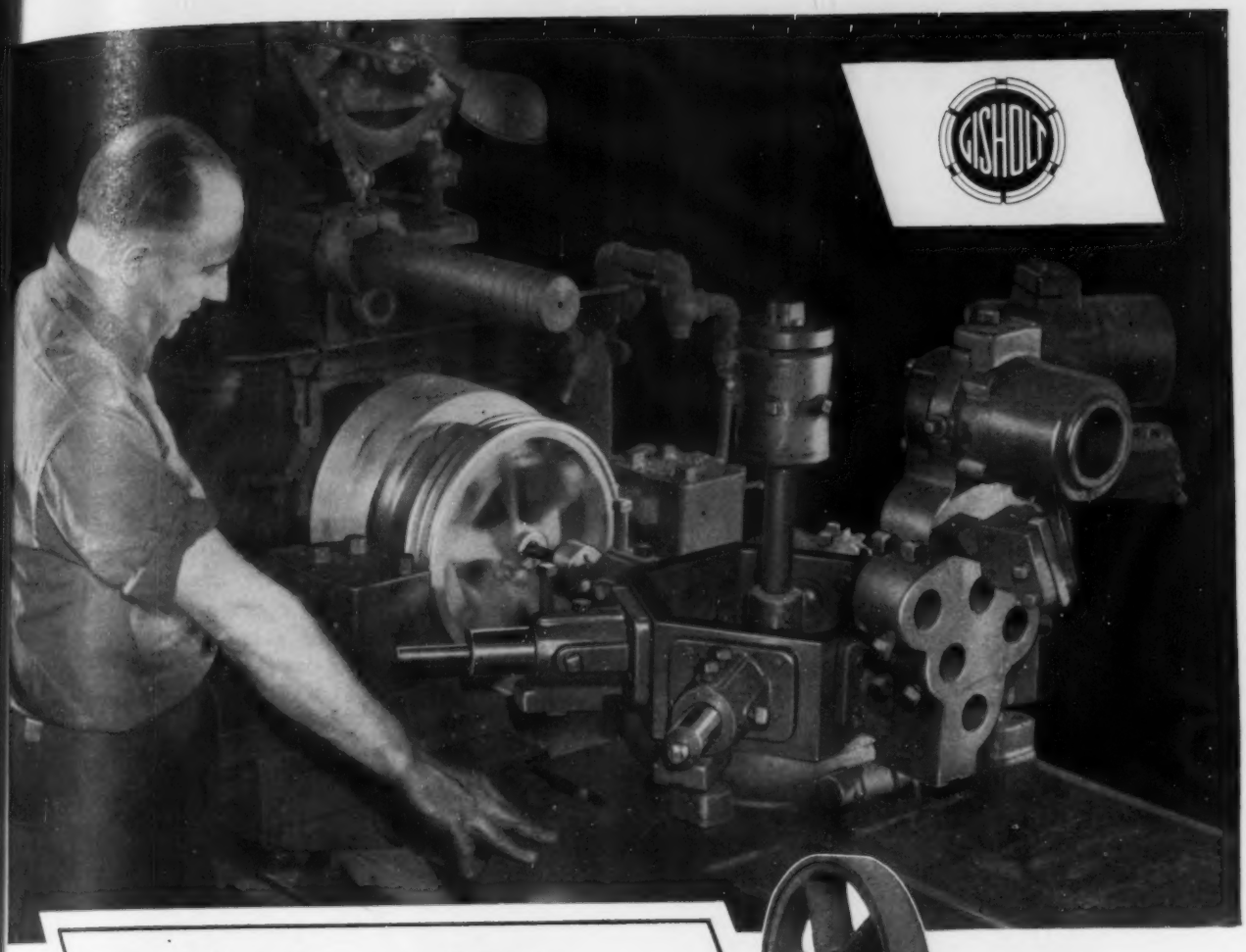
(3) Type of product—what are the size, precision requirements or special features of the product.

With this data, the department makes a flow chart to determine manufacturing sequence, determines the type of facilities needed, and determines the number of facilities and the layout. A final recommendation, accompanied by cost estimates, is submitted to top management for approval. Usually, one or two alternate proposals are also submitted.

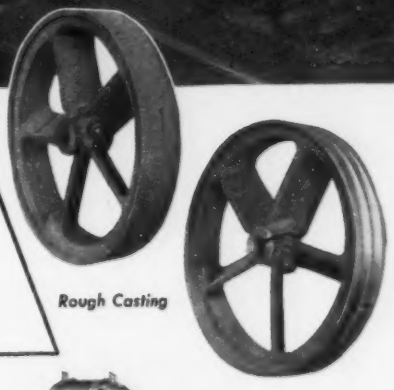
Key to development of efficient

Turn to Page 264

" . . . keeps the visiting firemen out from underfoot . . ."



Production Trebled by the *FASTERMATIC!*



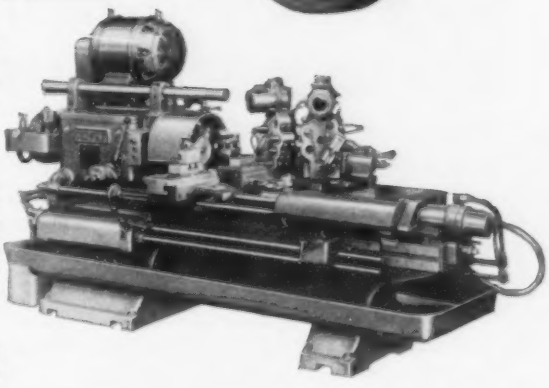
Rough Casting *Finished Sheave*

Note here the rather simple tooling arrangement for machining cast iron sheaves. This setup, similar to regular turret lathe work, is made just as easily. But here, the machine performs 15 different operations—holds tolerances consistently—completes the entire machining job in 13 minutes. The former time was 39 minutes.

Completely Automatic Cycle

It's the swift, automatic cycle of the Fastermatic that accounts for such substantial time savings. With its hydraulic feed system and automatic speed control, the operator has only to load the chuck, start the machine and remove the finished work. Usually, the operator has time to tend a second machine.

Now, when you need still greater production, it is a good time to look into the Fastermatics. Write for the Fastermatic catalog.



The Fastermatics are universal automatic turret lathes. Designed for accurate, high production turning, they can also be economically used on comparatively small lot work.

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

parts handling systems is volume. The possibilities of conveyerized lines and automation can be realized only if parts volume is sufficient to justify the higher costs of these methods. Ryan ties parts handling systems to economic factors governing the project and, consequently, the techniques are quite varied.

Parts Dollies Out

In building exhaust systems for Continental engines used in General Patton tanks, Ryan tried a straight-flow production line which is fed with a 140-ft powered conveyer belt. Because of high parts volume, this method of parts handling saves 40 pct of the space otherwise required, through the elimination of room for parts dollies.

This technique has doubled production, with slightly more facilities, because the conveyer provides a ready bank of parts in a uniform, accessible flow. Fatigue is lessened since employees are relieved from carrying parts and can devote their efforts to the production tasks.

Some Machine Loads Low

Another benefit is the balanced control of manufacture which a straight line permits. Every part must move to the next station.

To adapt a straight-flow production layout to a project requires not only high volume but also extra machine facilities. Since the parts are not permitted to back-

"Come on, let's take the 'elevated' tonight!"

ack in their travel, added equipent must be stationed along the e to perform every operation. evitably, some of these machines ill have to be operated at low d factors, depending upon their nction, line speed and so on.

Batch May Be Best

For some parts, such as the inr combustion chambers for jet ngines, both "batch" and producon line systems are used. The ough, Inconel cylinders are blankd, coined and louvered in the rming department where batch ts are sandwiched between other yan components.

Parts are then fed to a production line served by roller conveyer. Parts are aligned, spot welded, seam welded, inspected and boxed for shipment from the end of the conveyer line.

An overhead monorail conveyer system is employed to handle big fuel tanks for Boeing B-47 Stratojet aircraft. Handling method is dictated largely by processing requirements. The mammoth containers must be spray-painted, air-dried, sanded and inspected.

Since the tanks are bulky and require extended time for drying, this handling method offers temporary storage with handling.

Tracks and mobile fixture have been used to excellent advantage in fabrication of external fuel tanks. It takes four men to lift the sections of these tanks and more than 30,000 spotwelds are used to join them together.

Save Manpower Space

The handling system is designed to save manpower and space in bringing the containers to the big spotwelding machines and positioning them during the welding process.

From the center of the factory, individual sets of tracks were laid to each of the eight spotwelders. By means of overhead electric hoists, the heavy tank sections are loaded on special wheeled fixtures which travel on the tracks.

Designed to bring the tank seams into the electrode "jaws" at

Turn Page

the correct height, these fixtures are rolled to the machines. The tanks are free to rotate on rollers as welding takes place.

The layout has saved both direct and indirect manpower. One man can perform all loading, conveying, positioning and unloading operations instead of the four-man, two-man teams which would have been necessary.

These Rate High

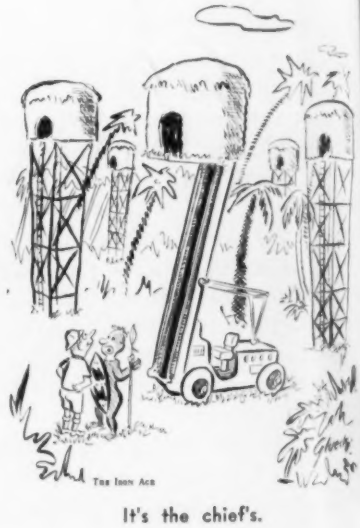
Among the space and time saving devices at Ryan, the mechanisms used for loading and unloading machines rate high in effectiveness. This is especialy true in the jet engine building where large aft frames and afterburners must be loaded into machines and furnaces.

Ryan has installed a system of swinging cranes equipped with air-operated hoists at every strategic location. These devices are surprisingly compact, consisting of a vertical tubular steel column, bolted to the floor, and a swinging steel "I"-beam arm.

Free to roll back and forth on this arm is a tiny air-motor chain hoist. These cranes are capable of handling up to 2000 lb components and are quite responsive to delicate control.

Ingenious loading devices include grid type conveyers to move jet engine parts into Knapp annealing furnaces. The conveyers

Turn to Page 268



It's the chief's.

——Technical Briefs——

are hydraulically moved into the furnace. Raised rails carry the trays back and forth. The system also shunts the trays to either side of the loading area so that the furnace can be unloaded and reloaded with a single opening of the door.

These mechanisms save manpower but, most important, they allow the furnace operators to stay on the job by removing them from the hot blast of the open furnace. With push-button controls, the operators can work at a safe, comfortable distance.

To transfer parts throughout the factory in the simplest fashion, Ryan designed and built a variety of custom-tailored racks.

UNLOADING:

Hydraulic tilt platform unloads coke trailer in 1 min.

A hydraulically elevated truck unloader is helping speed shipments of coke and carbon products between International Graphite & Electrode Div. and its parent company, the Speer Carbon Co.. The novel materials handling unit can unload 20,000 lb of coke from a trailer truck in 1 min.

Built by Kewanee Mfg. Co., the unloader tilts both tractor and trailer to a 40° angle. Coke is dumped into storage facilities where it is kept until processed for the manufacture of electrodes and other carbon and graphite products.

TRAILERLOAD of coke can be unloaded in 1 min with aid of hydraulic tilt table used by Spear Carbon Co. Unit was built by Kewanee Mfg. Co.

LAN PARTS FLOW:

Flexibility in new plant design pays off in years to come.

New plants designed for smooth arts flow, flexibility, and with lenty of room for expansion offer ividends in lower costs and moother operations in the years head.

When Black & Decker Mfg. Co., ig maker of portable electric ools recently moved to its new ountry plant—the company's sec- nd move in 35 years—the new Hampstead, Md., plant was design- d with its future in mind.

On Big Tract

The new plant, designed and built by The Austin Co., will preclude the necessity for multi-level operation which has complicated the utilization of the company's present Towson site.

The new plant is located on a 185-acre tract with direct access to the Western Maryland Railroad over a 1329-ft. siding, which terminates in the receiving bay inside the building on the North.

Wide Column Spacing

Six enclosed truck-loading docks have been provided for receiving and shipping. Expansion of the initial unit by extensions to the South, East and West will not disturb these facilities, which are now at the incoming and outgoing ends of a U-shaped production layout.

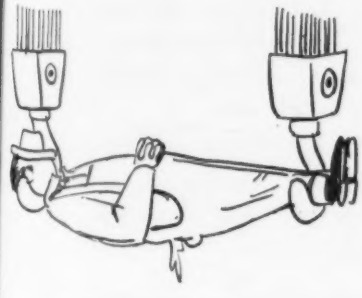
Adoption of wide column spacing (40 x 60 ft.) with 15-ft. vertical clearance and the use of Austin's "Unit-area System" for the installation of heating, ventilating and power distribution equipment insures maximum adaptability of the floors space to meet any future operating requirements.

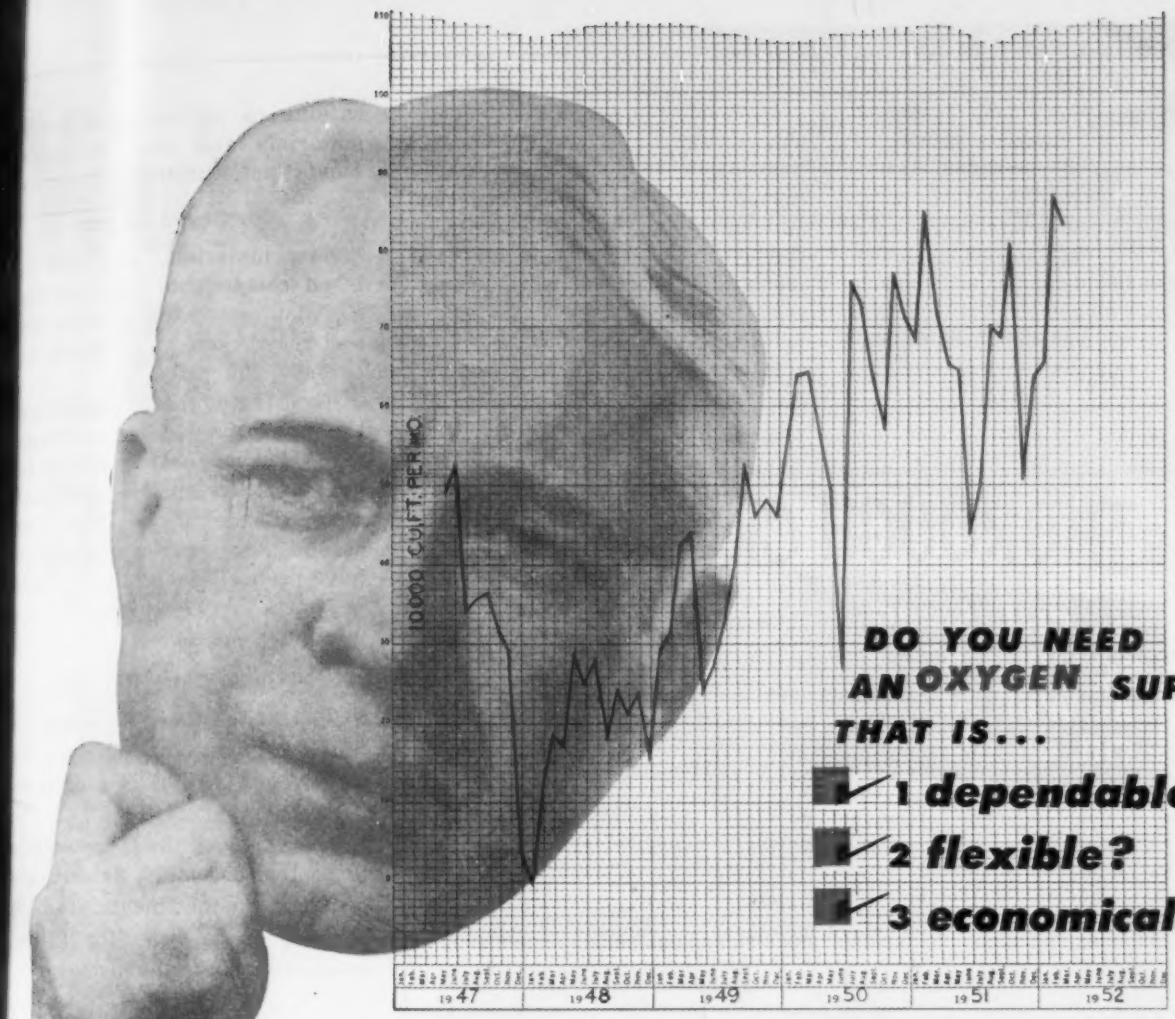
Unit-area platforms have been equipped with convertible air handling units with present provision for mechanical ventilation, but which can be readily supplemented to include conditioning of the air. The equipment platforms were raised into position in the trusses with all of the principal air handling units already in place.

Flexibility

Flexibility was built into this initial building unit. The building

Turn to Page 272





DO YOU NEED AN OXYGEN SUPPLY THAT IS...

- ✓ 1 dependable?
- ✓ 2 flexible?
- ✓ 3 economical?

1 If a complete or partial failure in your high-purity oxygen supply would hurt your production — you need a *dependable* supply. Airco can meet your demands for high-purity oxygen when and where you need it. Our vast network of plants in industrial areas is backed by adequate storage facilities, and a fleet of oxygen delivery trucks.

2 If your oxygen consumption varies like the typical example shown — you certainly need a *flexible* supply. You can meet peak requirements without the cost of extensive storage facilities — yet pay only for the exact amount you need when the demand lightens, without the many costs of idle capacity — by buying Airco oxygen.

3 No matter how much oxygen you use — you want an *economical* supply. Airco oxygen of a uniform high-purity is produced in volume for a nation-wide market — to give you, the individual user, low cost.

Call or write your nearest Airco office for help in planning the most economical oxygen supply for your needs. Airco specialists can help you *use* oxygen most efficiently, too.

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AN AIR REDUCTION PRODUCT

was needed to reduce congestion at the present plant, and was to house several of the large, space-consuming operations.

An additional floor area of 100,000 sq ft was determined to be the minimum required to achieve efficient operations at both plants. The building was designed before any final production plans had been made.

Wide column spacing and ready availability of light, power and ventilation made possible rapid layout of production processes and machinery once the limits of the 100,000-sq ft space and the scope of operations were known.

Equipment Position

It was possible to position all equipment in the best possible locations to achieve good flow of materials and good interdepartmental relationships.

U-shaped Layout

Raw materials, and some finished components from the Towson plant, enter the receiving area, and start on a U-shaped trip through the plant.

First leg of the U, consisting of the punch press, large casting machining, sheet metal, forging and heat treating departments, is much wider than either the base or the second leg. These departments have been placed so that handling of parts between them is at a minimum.

Finishing and Packaging

Base of the U contains space for finished parts storage, where the large, clear height is used to advantage.

Second leg of the U contains the large tool assembly, finishing and packaging departments. There is storage space here for finished goods awaiting shipment.

Shipping Facilities

Materials will be received and finished goods shipped from the warehouse area which is flanked on one side by the enclosed truck and rail dock. Materials will be handled in this area by one 5-ton monorail crane traveling east and west in either of the two most northerly bays. It switches between bays by transfer point.

Turn to Page 274

"Is that your idea of materials handling?"

WORKSHOP SEMINARS:

Representatives of major industries will take part in program.

A group of 42 speakers, representing many of the outstanding industries in the country, will head workshop seminars at the Materials Handling Conference which will be held concurrently with the fifth National Materials Handling Exposition at Convention Hall, Philadelphia, May 18 to 22.

The American Material Handling Society, an organization of users of handling equipment, is conducting the conference. Sessions will cover five basic aspects of materials handling. Each visitor will be able to spend 9 hours in a workshop discussion of a single aspect of his work, or 3 hr on each of three subjects.

This intensive approach has never before been attempted on a national scale, society officials pointed out. In view of the fact that most of those attending the conference will be authorities on the subject in their own right, the sessions are expected to provide many important new ideas on handling problems.

Conference sessions will take place from 9 a.m. to noon on three of the five days of the show. The morning hours have been set aside so that there will be no conflict with show attendance.

The five topics, each of which will be the subject of a seminar on each of the three days, include "Handling in Process," "Warehousing and Shipping," "Packaging for Improved Handling," "Bulk-Handling" and "Requirements for Organizations, Study and Analysis."

Those desiring advance registration cards, information about the conference and hotel reservations may obtain them from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Tuesday, May 19
9:00 a.m. to Noon

Co-Chairman: James J. MacDonald, Supervisor, factory methods and engineering section, General Electric Co., Philadelphia.

Handling in Process

Moderator: George A. Smith Material Handling Engineer, International Business Machines Corp., Endicott, N. Y.

Co-Moderator: S. P. McDaniels, Materials Handling Engineer, Western Electric Co., Kearny, N. J.

Turn to Page 276

"I suspect he's got that job souped up."

—Technical Program—

Continued

Warehousing and Shipping

Moderator: E. J. Klinstiver, Supervisor, Falls City Transfer Co., Jeffersonville, Ind.

Co-Moderator: Harold L. Bock, Material Hdlg. Engineer, RCA-Victor division, Radio Corp. of America, Indianapolis, Ind.

Packaging for Improved Handling

Moderator: R. C. Mottu, Supervisor of Stores, Koppers Co., Inc., Baltimore, Md.

Co-Moderator: F. H. Lee, Packaging Engineer, Aluminum Co. of America, New Kensington, Pa.

Bulk Handling

Moderator: O. W. Werner, Sales Manager, Link-Belt Co., Pittsburgh, Pa.

Co-Moderator: J. M. Broady, Coordinator of Material Hdlg. Methods, General Electric Co., Schenectady, N. Y.

Organization-Study-Analysis

Moderator: Donald C. Rhodes, Chief Industrial Engnr., Pitman-Moore Co., Indianapolis, Ind.

Co-Moderator: Donald R. Neil, Consulting Engineer, Drake, Startzman, Sheahan, Barclay, Inc., New York. N. Y.

Alternates: W. C. Carl, Industrial Engineer, Westinghouse Electric Corp., E. Pittsburgh, Pa.

H. Barber, Industrial Engineer, American Box Board Co., Grand Rapids, Mich.

Wednesday, May 20
9:00 a.m. to Noon

Co-Chairman: Norman B. Shikes, Manager, Material Hdlg. div., RCA-

"I've been made materials handling chief. Of course, you wouldn't know what that means."

Technical Program—

Continued

Victor division, Radio Corp. of America, Camden, N. J.

Handling in Process

Moderator: J. Wilfred Ferguson, Material Hdlg. Engnr., American Locomotive Co., Schenectady, N.Y.

Co-Moderator: James R. Bright, Editor, Modern Materials Handling, Boston, Mass.

Warehousing and Shipping

Moderator: Adolph L. Sebell, Plant Engineer, Will & Baumer Candle Co., Syracuse, N. Y.

Co-Moderator: William T. German, Supervisor of Stores, Glenn L. Martin Co., Baltimore, Md.

Packaging for Improved Handling

Moderator: Carl R. Plock, Sales Engineer, Logan Co., Louisville, Ky.

Co-Moderator: Adrian V. Van Riper, Packaging Engineer, Congoleum Nairn, Inc., Kearny, N. J.

Bulk Handling

Moderator: Benjamin H. King, Transportation Supt., E.I. Du Pont de Nemours & Co., Inc., Arlington, N. J.

Co-Moderator: F. W. Adami, Jr., Asst. to Supervisor of Engineering, Gillette Safety Razor Co., Boston, Mass.

Organization-Study-Analysis

Moderator: Alfred L. Struck, Jr., Technical Assistant, Colgate-Palmolive Peet Co., Jeffersonville, Ind.

Co-Moderator: C. W. Wirshing, Material Hdlg. Engineer, Behr-Manning Corp., Troy, N. Y.

Alternates: W. K. Dietz, Transportation Spvsr., Glenn L. Martin Co., Baltimore, Md.

L. E. Fink, Methods Engineer, General Electric Co., Inc., Schenectady, N. Y.

G. H. Schwab, Materials Hdlg. Engineer, General Electric Co., Inc., Schenectady, N. Y.

Thursday, May 21

9:00 a.m. to Noon

Co-Chairman: Edwin S. Kostro, General Superintendent, Philco Corp., Philadelphia, Pa.

Handling in Process

Moderator: R. W. Mallick, Staff Engineer, Westinghouse Electric Corp., E. Pittsburgh, Pa.

Co-Moderator: Lee B. Russell, Plant

Turn Page

—Technical Program—

Continued

Engineer, Brown-Foreman Distillers Corp., Louisville, Ky.

Warehousing and Shipping

Moderator: L. George Roedding, Material Hdlg. Spvsr., American Box Board Co., Grand Rapids, Mich.

Co-Moderator: G. M. Holland, Sales Engineer, Yarrington & Johns, Inc., Baltimore, Md.

Packaging for Improved Handling

Moderator: Ray E. Pigg, Methods Engineer, Eli Lilly & Co., Indianapolis, Ind.

Co-Moderator: R. W. Hawkes, Head of Material Hdlg., H. J. Heinz Co., Pittsburgh, Pa.

Bulk Handling

Moderator: W. W. Phillips, Mgr., Raw Material Hdlg., Eli Lilly & Co., Indianapolis, Ind.

Co-Moderator: Charles H. Asher, Material Hdlg. Engineer, American Radiator & Standard Sanitary Corp., Louisville, Ky.

Requirements for Organization-Study-Analysis

Moderator: Herbert H. Hall, Material Hdlg. Engineer, Aluminum Co. of America, Pittsburgh, Pa.

Co-Moderator: Allen F. Hardy, Plant Engineer, Norton Company, Worcester, Mass.

Alternates: E. D. Blickenstaff, Asst. General Storekeeper, Aluminum Co. of America, Pittsburgh, Pa. Robert H. Daut, General Manager, Harborside Warehouse Co., Inc., Jersey City, N. J. C. Deverall, Industrial Consultant, Indianapolis, Ind. W. Van Allan Clark, Asst. Professor of Business Management, Massachusetts Institute of Technology, Cambridge, Mass.

"Just what kind of a guy is this 'Terrible' McGurk?"

Materials Handling Show Exhibitors

Fifth National Materials Handling Exposition, Convention Hall, Philadelphia, May 18-22. Hours: 10:30 a.m.—5:30 p.m.

Exhibitors	Booth Numbers
A	
Acme Pallet Co.	1149
Acme Steel Co.	1002
Aerol Co.	1522
Aeroquip Corp.	1129
Ainworth Manufacturing Corp.	1818
Albion Industries, Inc	315
Alemite Sales Div., Stewart-Warner Corp.	529
Algene Marking Equipment Co.	212
Allan Industrial Products	1810
Allied Wheel Products, Inc.	1841
All Steel Welded Truck Co.	106
Alvey-Ferguson Co., The	1455
American Chain & Cable Co., Inc.	732
American Engineering Co.	328
American Machine & Foundry Co.	1133
American Machinist	1438
American Matling Co.	1021
American Monorail Co., The	610
American Pulley Co., The	821
American Steel and Iron Works, Div. of A. F. Anderson Iron Wks.	128
American Tape Printer Co.	332
American Tractor Corp.	926
Anchor Steel & Conveyor Co.	532
Anthony Co.	620
Arrow Products Inc.	444
Austin-Western Co.	1142
Auto-Nailer Co., The	828
Automatic Transportation Co.	1306
Automotive Industries	237

Turn Page

Exhibitors

Exhibitors	Booth Numbers
B	
Baker Industrial Truck Div., Baker-Raulang Co.	1234
Baldwin-Lima-Hamilton Corp.	144
Ballymore Co., The	140
Barber-Greene Co.	602
Barrett-Cravens Co.	1350
Basco Manufacturing Co., The	1833
Bassick Co., The	906
Beacon Machinery, Inc.	815
Belt Corp., The	434
Benbow Mfg. Co.	1500
Benton Harbor Engineering Works	1807
Berg-Gibson Manufacturing Co.	439
Better Packages, Inc.	502
Big Joe Manufacturing Co.	1434
Bond Foundry and Machine Co.	806
Bowers Battery & Spark Plug	1023
Brainard Steel Div., Sharon Steel Corp.	621
Brooks Equipment and Manufacturing Co.	1026
Brown-Line Corp.	528
Buda Co., The	202
Burroughs Manufacturing Co., Div. of American Metal Products Co.	832
Burrows Equipment Co.	237
Buschman Co., E. W., The	319
Butler Bin Co.	825
C	
C & D Batteries, Inc.	432
C.I.T. Corp.	913
Calabar Corp.	535
Cambridge Wire Cloth Co.	811
Century Products Co.	1823
Chain Belt Co.	1812
Chicago Pneumatic Tool Co.	1839
Chicago Tramrail Corp.	333
Chilton Co.	237
Chisholm-Moore Hoist Corp.	1526
William Christenson Co.	1809

"Naw, I never have trouble with anybody hitchin' a ride."

Exhibitors	Booth Numbers
City Machine and Wheel Co.	1542
Clark Door Co.	141
Clark Equipment Co., Industrial Truck Div.	A, B, 1600
Cleveland Crane & Engineering Co., The	1325-A
Clinch-Tite Pallet Co.	336
Clyde Iron Works, Inc.	312
Coffing Hoist Co.	407
Coles Cranes, Inc.	1333-B
Colson Corp., The	1239
Colson Equipment & Supply Co.	837
Conco Engineering Works	1402
Conover-Mast Publications, Inc.	1213
Continental-Diamond Fibre Co.	132
Continental Motors Corp.	1250-A
Conveyor Specialty Co.	1110
Crescent Metal Products, Inc.	404
Cushman Motor Works, Inc.	145

D

Dearborn Motors Corp.	1820
Dempster Brothers, Inc.	133
Detecto Scales, Inc.	340
Dico Co.	1800
Dings Magnetic Separator Co.	414
Distribution Age	237
Divine Brothers Co.	415
Doepke Manufacturing Co., The Charles William	714
Doerr Electric Corp.	609
Drake, Startman, Sheahan and Barclay	814

E

Econoweld Corp.	1831
Edison Storage Battery Div. Thomas A. Edison, Inc.	240
Elberta Crate & Box Co.	918
Electric Products Co., The	1416
Electric Storage Battery Co., The	1549
Elizabeth Iron Works	1145
Elwell-Parker Electric Co., The	1233
Elwing Corp., The	830
Emery Co., A. H.	304
Endress, Inc., William F.	1825
Engineering Research Associates, Inc.	411
Equipment Manufacturing, Inc.	1005
Equipto Div., Aurora Equipment Co.	802
Evans Products Co.	1829

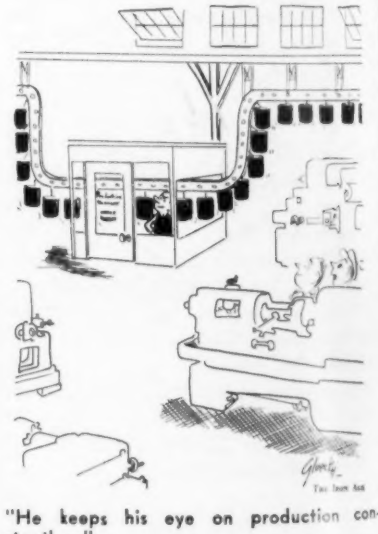
F

Fab-Weld Corp.	1505
Factory Management and Maintenance	1410
Fairbanks Co., The	520
Farley & Co., Arthur C.,	437
Farquhar Co., A. B., a Subsidiary of The Oliver Corp.	925
Faultless Caster Corp.	228
Ferguson Co., Harry J.,	322
Fibre Specialty Manufacturing Co.	440
Flexa-Steel Products, Inc.	509
Flexoid Conveyor Co., Div., The Smith Power Transmission Co.	131
Flow	208

Turn Page

Exhibitors

Exhibitors	Booth Numbers
Foote Bros. Gear & Machine Corp.	719
Ford Motor Co., Tractor & Industrial Engineer Div.	1821
Fungitrol Chemicals, Inc.	417
G	
Garlock Packing Co., The	1545
General American Transportation Co.	RR Siding
General Box Co.	122
General Electric Co., Apparatus Div	708
General Electric Co., Electronics Div.	801
Gerlinger Carrier Co.	1014
Gerotor May Corp.	917
Gerrard & Co., A. J.,	306
Gleason Corp.	339
Globe Co., The	828
Globe Hoist Co.	1252
Goodrich Co., B. F.,	104
Gould-National Batteries, Inc.	335
Grand Specialties Co.	114
Guilbert Inc.	1837
H	
Hanline Co., H. G.,	412
Harnischfeger Corp.	1509
Haslett Chute & Conveyor Co.	418
Hercules Flooring Co.	829
Hercules Motors Corp.	1813
Herman Co., Karl	328
Hertner Electric Co., The	1400
Hill & Son Co., Fred	806
Frank G. Hough Co., The	1349
Jacob House & Sons	826
Howe Scale Co., The	536
Hugest & Sons, Philip V.	513
Hydraulic Equipment Co.	1446
Hydroway Scales, Inc.	637
Hyster Co.	1206
I	
Ideal Stencil Machine Co.	525
Industrial Equipment Co.	609
Industrial Equipment News	110
Industrial Maintenance	1835
Industrial Truck Association	737



"He keeps his eye on production constantly—"

Exhibitors

Exhibitors	Booth Numbers
International Staple and Machine Co.	422
Iron Age, The	237
Ironbound Box & Lumber Co.	720
J	
Jaeger Machine Co., The	1802
Joyce-Cridland Co., The	308
K	
Kalamazoo Manufacturing Co.	1537
Truck-Man Div., The Knickerbocker Co.	115
Koch, Geo., Sons	921
Koehring Co.	1013
L	
Lamson Corp.	110
Lanham Co., The	349
Lansing Co.	325
Lewis, G. B., Co.	1300
Lewis-Shepard	1334
Lift Trucks, Inc.	1137
Little Giant Products, Inc.	430
Loomis Machine Co.	314
Lull Manufacturing Co.	1326
Louden Machinery Co.	510
M	
Magline, Inc.	604
Magne-Plastic Corp.	736
Magnesium Co. of America	1126
Maguire, Walter, Co.	615
Manning, Maxwell & Moore, Inc.	1406
Mansaver Industries	1518
Markem Machine Co.	112
Market Forge Co.	234
Marsh Stencil Machine Co.	824
Master Builders Co., The	125
Exhibitors	Booth Numbers
Material Handling Institute	636
Mathews Conveyer Co.	632
May-Fran Engineering, Inc.	1301
Mechanical Handling Systems, Inc.	905
Mercury Manufacturing Co., The	1533
Michigan Crane & Conveyor Co.	501
Michna Systems	425
Midwest Precision Corp.	1151
Mine Safety Appliance Co.	1827
Mobilift Corp.	1114
Mobile Industrial Equipment Corp.	1816
Modern Materials Handling	102
Motor Generator Corp.	1245
Motorola Inc., Communications & Electronics Div.	1120
Moto-Truc Co., The	902
N	
National Light Metals & Plastic Co.	804
National Pallet Corp.	1100
National Wooden Box Association	1202
Nutting Truck and Caster Co.	1514
O	
Ohio Hoist and Manufacturing Co.	1814
Orangeville Mfg. Co.	410
Otis Elevator Co.	605
Oxy-Catalyst Inc.	922
P	
Pallet Devices, Eberhardt Mfg. Co.	611

Turn Page

Exhibitors

Exhibitors	Booth Number
Paltier Corp., The	1544
Parker Sweeper Co.	334
Penton Publishing Co., The	1456
Pittsburgh Steel Products Co.	214
Pollock, Max	430
Port-A-Lift Co.	136
Porto-Rak Co.	134
Powell Pressed Steel Co.	1440
Powers Wire Products Co.	107
Pressed Steel Div., Republic Steel Corp.	1414
Prime-Mover Co., The	1520
Prior Products, Inc.	1801
Protectoseal Co., The	406
Pullman-Standard Car Manufacturing Co.	RR Siding

Q

Quaker Rubber Corp.	507

R

Rack Engineering Co.	1508
Radio Corp. of America, RCA Victor Div.	1250-B
Randolph Metal Products Co.	1803
Rapids-Standard Co., The	225
Raymond Co., The	1426
Ready-Power Co., The	1404
Revolvator Co.	724
Richards-Wilcox Manufacturing Co.	1552
Robbins & Myers, Inc.	910
Roebling's, John A., Sons Co.	721
Ross Carrier Co., The	1103
Rotary Lift Co.	344
Round, David, & Son	1504
Rowe Methods, Inc.	1519
Ruger Equipment, Inc.	1454
Rushlight's, Inc.	210

S

Saginaw Products Corp.	445
Service Caster & Truck Corp.	1450

"Of course I haven't been seeing that little tycoon downstairs, silly."

Exhibitors	Booth Numbers
Service Recorder Co., The	105
Service Supply Corp.	1006
Sheehan, R. T., Co.	809
Signode Steel Strapping Co.	1538
Silent Hoist & Crane Co.	1215
Skarnes Engineering & Supply, Inc.	338
Spanmaster Crane Corp. of America	527
Spaulding Fibre Co.	812
Speedways Conveyors, Inc.	704
Standard Conveyor Co.	1530
Standard Mfg. Co.	138
Stanley Works, The, Magic Door Div.	1200
Stanley Works, The, Steel Strapping Div.	1009
Star-Kimble Motor Div., Miehle Printing Press Mfg. Co.	428
Steel Products Fabricators	914
Sterling Bolt Co.	221
Stevens Appliance Truck Co.	514
Streeter-Amet Co.	1843
Sundstrand Machine Tool Co., Hydraulic Div.	914

T

Technical Publishing Co.	508
Tennant, G. H., Co.	728
Textile World	1438
Thew Shovel Co., The	1325-B
Thomas Publishing Co.	110
Thomas Truck & Caster Co.	901
Toledo Scale Co.	833
Tote System, Inc.	608
Towmotor Corp.	1225
Tracto-Lift Co.	628
Tractomotive Corp.	1000
Traffic Service Corp., The	402
Truscon Steel Company, Pressed Steel Div.	1414

U

Union Metal Mfg. Co., The	1106
Union Steel Products Co.	1241
Unistrut Products Co.	1209
Unit Crane & Shovel Corp.	1150
U. S. Spring & Bumper Co.	433
U. S. Steel Co.	633

V-Y

Vickers, Inc.	705
Waukesha Motor Co.	729
Wayne Crane Div., American Steel Dredge Co.	1420
Webb, Jervis B., Co.	524
Weber Addressing Machine Co.	1550
Wellington Machine Co., The	1135
West Bend Equipment Corp.	624
Westinghouse Electric Corp.	1333-A
Whiting Corp.	1138
Whitney Chain Co.	123
Wilkie Co., The	725
Williford Mfg. Co.	405
Wilshire Power Sweeper Co.	504
Wirebound Box Manufacturers Association	245
Yale & Towne Manufacturing Co., The	Stage, 248

Extra Charge Increases Spread Through Industry

Nearly all tonnage items will have extras hiked . . . May end in buying pattern shift . . . Base prices will go up with wages . . . Steel's '53 earnings outlook tops '52 by wide margin.

Increases in steel extra charges now spreading through the industry will eventually embrace nearly all tonnage products. And any wage increase steelworkers manage to win in seventh round bargaining will be passed on to consumers by raising base prices of steel.

Most steel producers declined to estimate average increases in their extra charge (for special processing to meet consumer specifications). They contend that to the individual steel user such an average is meaningless. Also they say that charges in extras are usually followed by changes in buying patterns, as individual consumers shop for the "best buys" that will suit their steel needs.

Here's How Much

THE IRON AGE has arrived at the following estimated averages of extra increases per net ton based on representative orders on mill books:

Hot and cold-rolled sheets and hot-rolled strip, up $1 to $2; hot-rolled carbon steel bars, up slightly less than $5; cold-finished carbon bars and steel shafting, up slightly under $10; concrete reinforcing bars, up $4; wire rods, up $2 to $4; nails, negligible increase; fence, no change to $3 higher (depending on type); baling wire, up $6; wire fabric, up about 4 pct.

Reflect Nickel Costs

Extras on some grades of alloy bars and semi-finished steel ranged up to $30 a ton, reflecting increases in cost of nickel. Changes in extras on carbon tube rounds ranged from minus $3 to plus $10.

Bethlehem Steel Corp. has followed Colorado Fuel & Iron Corp. in raising bases prices of rails $6 a ton and track accessories $3 a ton. Rail products had long been notoriously poor earners.

In raising prices a number of steel officials pointed out their present increases were to cover past cost increases they were not able to reflect under government price control. Most steel companies had not altered extra charges for 3 or 4 years. Had it not been for price controls extras would have been revised sooner.

See Higher Earnings

The earnings outlook for the steel industry has taken a sharp turn for the better. Here are the main factors pointing to higher earnings:

¶ Industry earnings during the first quarter of this year are about 22.8 pct higher than they were during the similar period of 1952.

¶ Prospect of excess profits tax relief later this year may place the gain in earnings even higher.

¶ Current increases in extra charges and base prices raise profit potential of steel companies.

¶ Steel companies will maintain their higher earning potential by raising base prices if higher costs result from seventh round wage bargaining.

¶ Consumer demand seems to assure high operating rates through most of this year.

¶ The wage question is expected to be settled without a strike—it will be recalled that the worst strike in the history of the steel industry held back earnings last year.

The 22.8 pct gain in first quarter earnings over last year is based on an IRON AGE compilation of earnings of 28 companies representing about 86 pct of the industry's ingot capacity.

The 28 companies earned $157 million in first quarter 1953, compared to $127.8 million in first quarter 1952, a gain of $29.2 million.

Most steel companies charged the maximum 30 pct for excess profits taxes. If this law is allowed to expire at midyear (as expected), these charges may later be cut in half.

Rapid Writeoffs Help

Another favorable factor shown by a number of steel company balance sheets is 5-year amortization of steel facilities expanded to support the defense effort. Had it not been for the so-called "fast tax write off" the accelerated portion of amortization would have shown up as additional taxable profit.

Steel business continues to set a scorching pace, although there is admitted softness in some wire products and galvanized sheets. Third quarter order books are also slow to fill on small sizes of bars cold-finished.

Demand is strongest for hot and cold-rolled sheets; large sizes of bars (both hot-rolled and cold-finished); heavy plates and structurals; and oil country goods. There is still talk of easing later this year, but forecasters keep pushing their predictions farther into the future.

Raw materials are in good supply. Scrap has been sluggish for several weeks, and iron ore and manganese supplies are adequate for capacity output.

Scrap prices continued their steady decline. This week THE IRON AGE Steel Scrap Composite Price fell 50¢ a ton to $38.83 per gross ton.

Steelmaking operations this week are scheduled at 100.5 pct of rated capacity, unchanged from last week.

Market Briefs and Bulletins

Stockpile Shrinks . . . Titanium demand has leaped since January when 250 tons of sponge were in stockpile. Last week supply was down to 131 tons. DMPA will release sponge on priority basis since orders top stocks. Output is now rated at 5000 tons a year. A shade over 3000 tons were made in '52. Aircraft, Ordnance demand has grown. Ordnance will get 20 pct of Bureau of Mines Boulder City, Nev., output, which will be hiked immediately to full capacity of 20 tons a month.

Cut Prices . . . General Electric's Carboloy Dept. has reduced prices on a major portion of its standard die line. Prices of most sizes were cut at least 10 pct, while some of the more commonly used sizes were reduced even more. R-1 rough-cored die is now 25 pct less.

Construction Rate Increases . . . New construction for April was valued at $2.6 billion, 5 pct more than for the same month last year. Total for the first 4 months of 1953 is more than $9.6 billion, $500 million more than for same period last year. Industrial construction is running behind last year's rate, reflecting the tailing off of expansion programs in basic industries.

Study Atomic Power . . . Atomic Energy Commission this week cleared 12 more industrial firms for participation in the joint government-industry study of atomic power and its possible applications for commercial use. Dow Chemical and Detroit Edison continue as primary participants.

Moly Market . . . Molybdenite Corp. Ltd., of Montreal, will expand mining facilities in Quebec in return for a guaranteed market in the U. S. for up to 6 million lb of molybdenite and as much as 450,000 lb of bismuth. A floor has been set at 63¢ for 90 pct molybdenite concentrates which is not bought under the regular option or the company does not sell at a higher price.

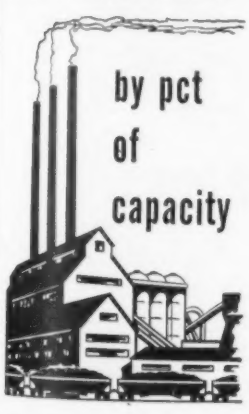
Worth More . . . Consumer wealth in the U. S. is estimated at more than $800 billion, an increase of more than 50 pct since the end of World War II. National Industrial Conference Board reports that half the families in the U. S. now have a net worth of $7500 or more, while a sixth of all families own more than $30,000 in net assets. The four-fifths of all families who earn less than $5000 per year own nearly half the nation's wealth. In another report on the nation's economy, National Bureau of Economic Research, Inc., states that the share of total income going to the top 1 pct of total population before taxes dropped from 12 pct in 1939 to 8.5 pct in 1947, and there has been no significant rise since that time.

Quote Prices . . . Oglebay, Norton & Co., Cleveland, is now quoting the following prices on metallurgical grades of fluorspar: 60 pct calcium fluoride, $38 per net ton; 70 pct, $42.50; 72.5 pct, $44. Prices are f.o.b. Rosiclaire, Ill.

Set Alloy Record . . . Production of 916,149 net tons of alloy steel (other than stainless) in March was the highest monthly production rate since early in World War II. American Iron and Steel Institute reports first quarter output of 2,613,241 tons was also a postwar record and was more than double the 6.6 pct increase in total steel production during same period.

More Controls Go . . . National Production Authority has lifted inventory ceilings on steel, copper and aluminum by revoking CMP Reg. 2. All controls on platinum have been discarded with revocation of M-54, and cobalt controls have been eased to the extent that salts and compounds from residues not suitable for metallurgical applications may now be used for some other purposes.

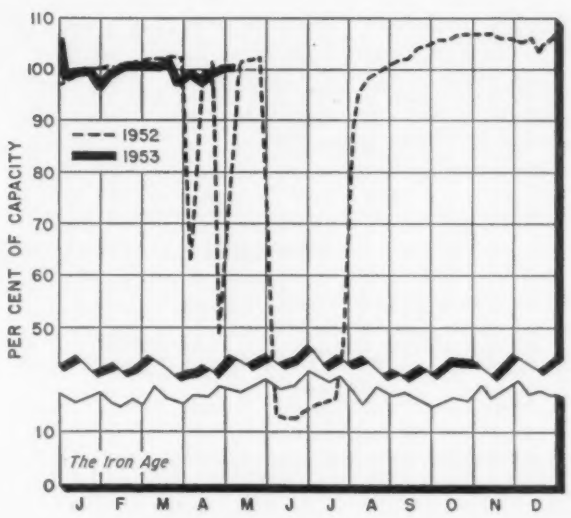
STEEL OPERATIONS



District Operating Rates

District	Week of May 3	Week of Apr. 26
Pittsburgh	99.0	97.0*
Chicago	105.0	105.5
Philadelphia	98.0	95.5
Valley	102.0	102.0
West	105.0	103.0*
Cleveland	98.0	97.0
Buffalo	106.5	94.0
Detroit	105.0	105.0
Birmingham (South)	101.0	102.0
Wheeling	102.0	102.0
South Ohio River	84.5	88.5
St. Louis	92.0	92.0
East	88.5	121.0*
AGGREGATE	100.5	100.5

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.
* Revised



Are Sliding Tariffs Good or Bad?

Zinc industry divided on proposed legislation . . . Diecaster says use would drop 50 to 60 pct . . . Canadians expected to retaliate with export duty on nickel—By *R. L. Hatschek.*

It all depends on which side of the fence you're on. Many zinc mine producers, particularly the ones with high cost operations, are strongly in favor of the sliding scale tariff bills in Congress. Custom smelters disagree.

And so do consumers—with vehemence. W. J. During, president of Precision Castings Co., Inc., made the strongest statement of the recent American Zinc Institute meeting in St. Louis. He told zinc producers that at 15.5¢ per lb they would be pricing themselves out of the market.

Would Switch Metals . . . According to Mr. During, diecasters would cut their use of zinc by 50 to 60 pct if the metal were pegged at 15.5¢. Machines would be converted to aluminum and magnesium as fast as it could be done.

He pointed out that diecasters have had to obtain Canadian zinc for diecasting for the past 10 years because U. S. producers just can not supply enough to satisfy demand. He termed the proposed action "suicide."

The brass mill industry, through Copper and Brass Research Assn., also went on record against sliding scale tariffs. And the Administration early this week voiced its opposition to the Simpson Bill.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in April based on quotations appearing in THE IRON AGE were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	30.700
Lake Copper, delivered	32.897
Straits tin, New York	$1.0113
Zinc, East St. Louis	11.000
Zinc, New York	11.829
Lead, St. Louis	12.440
Lead, New York	12.640

Tit For Tat . . . Needless to say, the proposals are not very well received in Canada. It seems almost a sure bet that as soon as a sliding scale tariff on lead and zinc is voted into being in the U. S., the Canadian government will slap an export tariff on certain other raw materials. At the top of the list would be nickel, for which the U. S. is almost totally dependent on Canadian sources.

On Again, Off Again . . . Washington may call a halt to stockpiling of aluminum during the last 6 months of this year. A group of aluminum producers has made this request to National Production Authority as a means of permitting mills to catch up on their military and civilian orders.

NPA estimates the supply of aluminum for civilian goods in the third quarter may be about 15 pct less than the supplies available in recent months.

Producers also want the government to reconsider its production expansion program. Some firms, it is reported, are experiencing difficulty in obtaining financing for expansion purposes. There's need for more government loans to finance expansion, the NPA is told.

Cut Ingot Prices . . . Continued skidding of tin prices and prices for copper and copper alloy scrap have resulted in another reduction in secondary brass and bronze ingot prices. New quotations are 1¢ to 2½¢ lower than last week's figures.

Dealers' buying prices for copper and brass scrap are also generally lower this week, with No. 1 heavy copper and wire pegged at 21¢ per lb, off 1¢ to 2¢, with other grades down ½¢ to 1¢. Lead scrap prices moved up, following the boost in refined lead last week.

Custom smelters are now paying 22½¢ for No. 1 copper wire. This pegs midsummer electrolytic copper at about 26¢.

Cut Brass Mill Prices? . . . Brass mill products prices have been pegged according to a 32.6¢ average copper price. This was arrived at by averaging 60 pct domestic 30¢ copper and 40 pct Chilean 36.5¢ copper. But for the future it is very doubtful that brass mills will pay anything over 30¢.

With this in mind, people are wondering what's going to happen to brass mill prices. It seems they ought to go down.

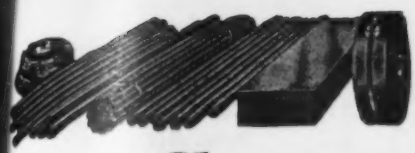
New Magnesium Alloy . . . Dow Chemical Co. has come up with a new alloy for commercial diecasting firms. Designated Dowmetal AZ9 1B, it contains beryllium additions for lower melt loss and increased efficiency, Dow states. Price tag is 30.5¢ per lb f.o.b. shipping point.

NONFERROUS METAL PRICES

(Cents per lb, except as noted)

	Apr. 29	Apr. 30	May 1	May 2	May 4	May 5
Copper, electro, Conn.	29.50-30.00	29.50-30.00	29.50-30.00	29.50-30.00	29.50-30.00	29.50-30.00
Copper, Lake, delivered	....	....	....	....	....	....
Tin, Straits, New York	95.00	94.00	93.00	....	96.50	96.50*
Zinc, East St. Louis	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis	12.30	12.30	12.30	12.30	12.30	12.30

Note: Quotations are going prices.
*Tentative



BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

Sentinel Shower Mixing Valve Improved by Using Duronze III

Teamwork between the product engineer and metallurgist is most essential for products expected to function properly for many years.

Many a properly designed engineering product fails from wear or corrosion when unsatisfactory metals or alloys are used in its construction. Consequently, it pays to consult the laboratory before writing metal specifications.

A Better Mixing Valve

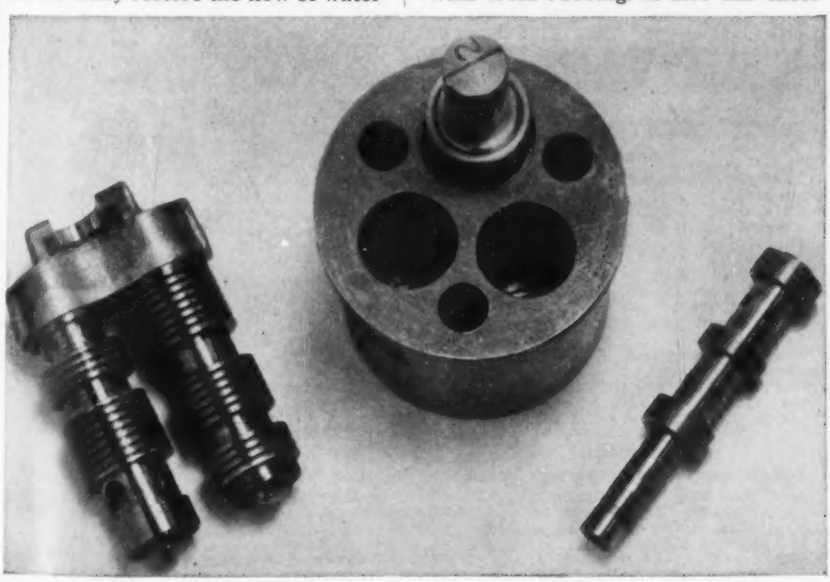
The balanced pressure mixing valve illustrated below is designed to hold the desired discharge temperature of the water by controlling the initial water pressure. It is accomplished not by thermostats, rockers, or springs, but by means of a floating piston or "Sentinel" (shown in the lower right-hand corner of the illustration below). This prevents sudden surges of steam, hot or cold water resulting from "water stealing" down the line. Even if the hot or cold water supply fails entirely, the "Sentinel" will immediately shut off the shower to a mere drip and then automatically restore the flow of water when the pressure returns.

This type of construction calls for extreme precision. Both the plungers and the floating "Sentinel" or piston must work freely in the valve block with very close tolerances. They must not contract, expand or change in size with wide temperature ranges of hot or cold. The metal must be hard and wear resistant. Yet it must have good machinability.

Duronze III, silicon aluminum bronze, containing approximately 91% copper, 7% aluminum, and 2% silicon meets all of these special requirements. In the annealed condition it has a tensile strength in the neighborhood of 90,000 pounds per square inch and a Rockwell hardness of B85. It has a machinability rating of 60% as compared to free cutting brass rod which carries a 100% rating.

Duronze III is supplied in rod form only—for making screw machine parts or for producing hot forgings.

When in contact with another metal or alloy such as brass, it has a low coefficient of friction and withstands wear from rubbing. It also has excellent resistance to corrosion from various types of waters, both hot and cold.



Plungers (left), valve block (center) where plungers are seated, and Floating Sentinel (right). Courtesy Speakman Company, Wilmington, Delaware.

Sentinel shower with any stream head. Courtesy Speakman Company, Wilmington, Delaware.

There are many places where Duronze III parts can impart greater strength, endurance and corrosion resistance to a product. Examples are valve stems for water valves; sleeves for compression fittings to reduce effects of vibration on the tubing; parts for pumps, check valves; water meters, controlling and regulating instruments; wire and cable connectors; oil burner nozzles; bolts, nuts, pole line and marine hardware; small gears, pinions—to name a few.

If your engineering department is getting ready to launch a new item, or is trying to improve an old one, or if your product is failing from excessive corrosion or wear, contact the nearest Bridgeport sales office for help from our metallurgical laboratory. Write for the "Duronze Manual," which contains engineering data on silicon bronze and silicon aluminum bronze.

(9769)

Nonferrous Prices

(Effective May 5, 1953)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188-in., 2S, 3S, 32.9¢; 4S, 61S-O, 34.9¢; 52S, 37.2¢; 24S-O, 24S-OAL, 35.9¢; 75S-O, 75S-OAL, 43.6¢. 0.081-in., 2S, 3S, 34.1¢; 4S, 61S-O, 36.6¢; 52S, 38.9¢; 24S-O, 24S-OAL, 37.2¢; 75S-O, 75S-OAL, 45.7¢. 0.032-in., 2S, 3S, 35.9¢; 4S, 61S-O, 40.6¢; 52S, 43.5¢; 24S-O, 24S-OAL, 45.6¢; 75S-O, 75S-OAL, 57.0¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 30.9¢; 4S-F, 33.0¢; 52S-F, 34.7¢; 61S-O, 33.6¢; 24S-O, 24S-OAL, 35.4¢; 75S-O, 75S-OAL, 42.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.4¢ to 80.3¢; 12 to 14, 37.1¢ to 97.2¢; 24 to 26, 39.7¢ to $1.27; 36 to 38, 47.0¢ to $1.86.

Rod, Rolled: 1.064-in. to 4.5-in., 2S-F, 3S-F, 41.0¢ to 36.6¢; cold-finished, 0.375-in. to 3.499-in., 2S-F, 3S-F, 44.2¢ to 38.3¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32-in., 58.4¢ to 45.9¢; ⅜ to 1½-in., 45.3¢ to 42.6¢; 1 9/16 to 3-in., 42.0¢ to 39.3¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 43.2¢ to 31.7¢; 52S, 52.4¢ to 38.3¢; 17S-T4, 59.0¢ to 41.0¢; 61S-T4, 52.9¢ to 40.5¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2 in., 40.5¢ to 59.0¢; 2 to 4 in., 36.6¢ to 49.7¢; 4 to 6 in., 37.1¢ to 45.3¢; 6 to 9 in., 37.6¢ to 47.5¢.

Roofing Sheet: Flat, per sheet, 0.019-in., 28 x 72 in., $1.247; x 96 in., $1.662; x 120 in., $2.077; x 144 in., $2.494. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢; 0.024 in. x 28 in., 29.3¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 66¢; 3/16 in., 68¢; ⅛ in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness; OD, ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless Tube	115½	100½	137½
Shot, blocks	....	57	...

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	48.51	....	50.58
Copper, h-r	50.48	46.83	....
Copper, drawn	....	48.08	....
Low brass	45.99	45.68	....
Yellow brass	42.87	42.56	....
Red brass	47.11	46.80	....
Naval brass	47.01	41.07	42.33
Leaded brass	....	....	39.95
Com. bronze	48.76	48.45	....
Mang. bronze	50.73	44.62	46.18
Phos. bronze	70.50	70.75	....
Muntz metal	44.91	40.47	41.72
Ni silver, 10 pct	56.56	59.83	62.89

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	20.50
Aluminum pig	19.50
Antimony, American, Laredo, Tex.	34.50
Beryllium copper, per lb conta'd Be.	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	29.50 to 30.00
Copper, Lake, delivered	....
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$175 to $185
Lead, St. Louis	12.30
Lead, New York	12.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	27.00
Magnesium, sticks, 100 to 500 lb.	45.00 to 47.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	$195 to $197
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	85.25
Tin, New York	96.50
Titanium, sponge	$5.00
Zinc, East St. Louis	11.00
Zinc, New York	11.83
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	26.00
No. 120	25.00
No. 123	24.00
80-10-10 ingot	
No. 305	30.00
No. 315	28.00
88-10-2 ingot	
No. 210	38.25
No. 215	34.75
No. 245	30.25
Yellow ingot	
No. 405	21.25
Manganese bronze	
No. 421	26.50

Aluminum Ingot

(Cents per lb del'd., 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	24.50-26.00
0.60 copper, max.	24.25-25.50
Piston alloys (No. 122 type)	22.50-24.00
No. 12 alum. (No. 2 grade)	22.00-22.50
108 alloy	22.50-23.50
195 alloy	22.75-24.00
13 alloy (0.60 copper max.)	24.25-24.75
ASX-679	22.50-23.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	23.00-26.00
Grade 2—92-95%	22.50-24.50
Grade 3—90-92%	22.00-23.50
Grade 4—85-90%	20.50-23.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	45.14
Electrodeposited	37.98
Flat rolled	45.64
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	79.50
Roller, depolarized	80.50
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over.)

	Heavy	Turnings
Copper	28⅝	27⅝
Yellow brass	21⅝	19⅝
Red brass	25½	24½
Comm. bronze	26⅛	25⅛
Mang. bronze	20	19
Brass rod ends	19¾	....

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	22½
No. 2 copper wire	21
Light copper	19½
* Refinery brass	18½

* Dry copper content.

Ingot Makers' Scrap

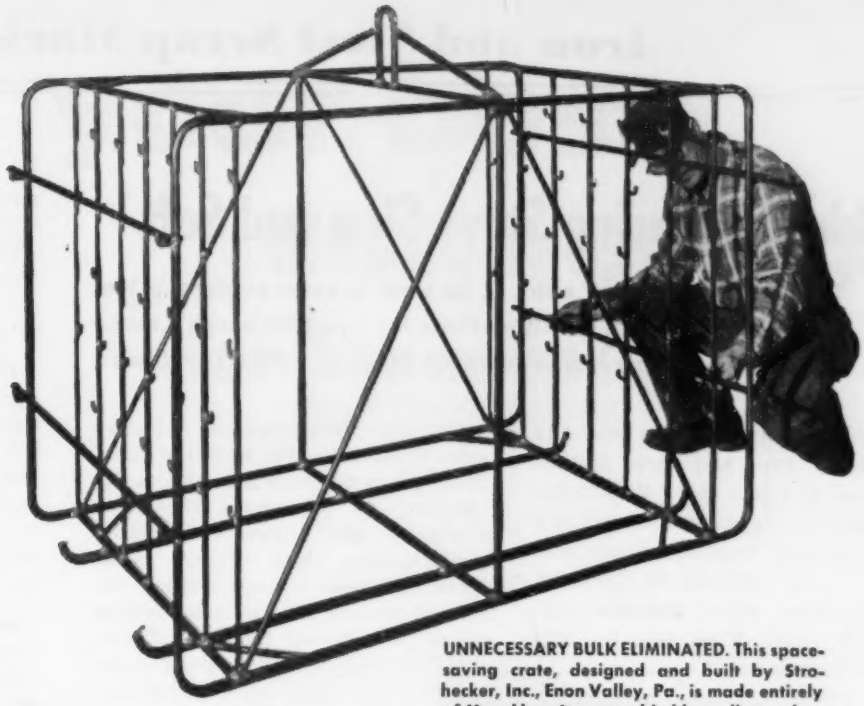
(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	22½
No. 2 copper wire	20 —21
Light copper	19 —20
No. 1 composition	18
No. 1 comp. turnings	17½
Rolled brass	14
Brass pipe	15
Radiators	14
Aluminum	
Mixed old cast	12¾—13¼
Mixed new clips	13 —15
Mixed turnings, dry	12½—14
Pots and pans	12¾—13¼

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heay copper and wire	21
No. 2 heavy copper and wire	19
Light copper	17½
New type shell cuttings	17½
Auto radiators (unsweated)	13
No. 1 composition	17
No. 1 composition turnings	16½
Unlined red car boxes	16
Cocks and faucets	15
Mixed heavy yellow brass	11½
Old rolled brass	14
Brass pipe	16
New soft brass clippings	17½
Brass rod ends	16½
No. 1 brass rod turnings	16
Aluminum	
Alum. pistons and struts	5
Aluminum crankcases	8
2S aluminum clippings	11½
Old sheet and utensils	8
Borings and turnings	5½
Misc. cast aluminum	8
Dural clips (24S)	9
Zinc	
New zinc clippings	5½
Old zinc	4½
Zinc routings	2½
Old die cast scrap	3½
Nickel and Monel	
Pure nickel clippings	100
Clean nickel turnings	60 —70
Nickel anodes	100
Nickel rod ends	100
New Monel clippings	33 —35
Clean Monel turnings	25
Old sheet Monel	30 —32
Nickel silver clippings, mixed	14
Nickel silver turnings, mixed	12
Lead	
Soft scrap, lead	9¼— 9¾
Battery plates (dry)	4¾— 5
Batteries, acid free	3¾
Magnesium	
Segregated solids	15 —16
Castings	14 —15
Miscellaneous	
Block tin	80
No. 1 pewter	65
No. 1 auto babbitt	45
Mixed common babbitt	13½—14
Solder joints	15
Siphon tops	45
Small foundry type	14½
Monotype	12 —12½
Lino. and stereotype	11 —11½
Electrotype	9¼— 9½
Hand picked type shells	7½
Lino. and stereo. dross	4
Electro dross	3½



UNNECESSARY BULK ELIMINATED. This space-saving crate, designed and built by Strohecker, Inc., Enon Valley, Pa., is made entirely of Monel bar. It was welded by ordinary shop methods, using "43" Monel gas welding wire, as recommended by Inco's Technical Service.

This sturdy, all-welded crate ADDS 50% TO PICKLING TANK CAPACITY

Here's a crate that carries a special message for every user of pickling equipment.

Strohecker, Inc., of Enon Valley, Pa., designed it for a customer who pickles the long, steel reflectors used behind fluorescent lights.

Of welded Monel® construction, the crate weighs only 350 pounds, and safely handles a 1,000-pound load of reflectors. It operates in a sulfuric acid solution of 5 to 10% concentration held at 180 to 200° F.

Thanks to this compact, light-weight crate, Strohecker's customer is now getting a 50% greater pay-load into his pickling tank—on *every* load. He's saving not only time, but labor, power and acid. And that's only natural—because he's pickling more reflectors (and less crate!) on each trip into the acid.

Check your own equipment today. There's a good chance Monel can help increase the efficiency of your pickling room, too.

For Monel is strong . . . tough . . . long-lasting. It resists hot sulfuric and other pickling acids commonly used in steel mills. It stands the bumps and jolts that fracture less ductile metals.

In addition, Monel offers *work-ability*. It can be fabricated by ordinary shop methods. And it can be welded—welded so perfectly that the joints have all the strength and corrosion resistance of Monel itself!

Keep Monel in mind. It makes rugged crates and racks . . . hooks and hangers . . . yokes . . . chain . . . pickle bars and accessories. It is advisable to place equipment orders with your supplier well in advance of scheduled use. Distributors of Inco Nickel Alloys can supply the latest information on availability from warehouse and mill.

The booklet, "Where Monel Pays its Way in Pickling," has been specially prepared to show you how useful Monel can be. Write us for your copy — now.

INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Monel PICKLING EQUIPMENT — extra life, extra capacity, extra safety

Lackluster Trading Stays Slow and Soft

Trading held to a low ebb . . . So slow in some centers, prices must be appraised . . . All markets hit . . . Pittsburgh's major consumer may snub market through May . . . Pity scrap dealer.

Lackluster trading in a slow and soft scrap iron and steel market was held to a low ebb. With some markets holding at last week's low prices, mainly because buying was so dull it was difficult to pin down a firm price, other markets continued to skid. When was the bottom to be reached?

In Pittsburgh the downtrend was seen continuing and the largest consumer was holding up shipments—probably through May. In Philadelphia and New York a sag was developing within the sag. Detroit business was so listless that downward revisions of prices had to be based on appraisal. Similar sluggish circumstances prevailed in all the other scrap centers.

Pity the poor scrap dealer who must cope with tougher screening of carloads while business flops. His overhead remains as high as ever. Though he may resort to layoffs, he needs more manpower per ton to prepare scrap for hawk-eyed inspection. He is finding out again that scrap is a raw material that will be reaped when it's needed.

Pittsburgh—With market tone unchanged, lack of activity makes it difficult to set a going price. Consensus is that the downtrend continues. The largest consumer here is holding up shipments, probably through May. Prospects of a purchase to establish a firm market are not good over the next 2 months. Strictly industrial low phos reportedly is bringing more than quoted prices but in the aggregate, yard material is in line with quotation. Scrap rails and rail crops are said to be resisting the trend. Blast furnace and cast continue weak. No. 2 bundles price in Apr. 30 issue was a typographical error. Correct quotation was $33.00 to $34.00.

Chicago—With reported dealer sales of No. 2 bundles at $30 and premium grade turnings available at $20 top, the market moves slowly on minimum sized orders. Foundries were slowing their buying. While some feel blast furnace grades will hit bottom soon, it's said steel-making grades and electric furnace will continue to slide. Forge crops, popular only 2 weeks ago, were going begging. At the dealer level, heavy melting was holding better in price than were bundles.

Philadelphia—Dealers are wailing the blues. Since Philadelphia prices are traditionally $2 to $3 under Pittsburgh, they're sure that the present skid has some more to go. Steelmaking grades are all cheaper this week, as are railroad grades, turnings and some cast items. Intake is reported dropping drastically.

New York—A sag within the sag was developing in this market last week. There was a feeling that new prices would be somewhat below what they were previously. Price for No. 2 steel was $29 to $30 and No. 2 bundles, $26 to $28. Blast furnace grades inched down another $2 while cast grades also slipped. Dealers were hurting as shipping volume sank, labor costs per ton of scrap rose, and overhead remained same while prices fell.

Detroit — Downward spiral of the market continued here and trade conversation hinged around 1949 reminiscences. Situation was even more confused because Detroit mills stayed out of the market and concrete quotations for No. 1 and No. 2 grades were impossible to get. Downward revisions were based in general on appraisal.

Cleveland—Steelmaking grades were steady but uncertain this week in the absence of new buying. Market remains bearish although some railroad steel went at the old OPS ceiling before bidding closed this week. Low phos dropped $3 to $45. Mill buying is still nominal as hot metal yield and inventories remain high. Turnings market was sloppy with only straight production scrap commanding top dollar.

Birmingham—The scrap market is getting weaker. New slashes in prices were made this week in most items, but only small amounts of tonnage were sold. A few of the better-financed dealers are said to be resisting further price cuts, but the majority are bowing to the apparently inevitable, although with grumbling.

St. Louis—A leading steel mill has lifted its month-old embargo on receipt of scrap which had depressed the market. Another leading mill is still holding shipments to small limits. Dealers can call the tune on prices for all the material they can sell.

Cincinnati — No. 1 heavy melting eased off 50¢ and low phos $1 in a very slow market. Two large mills in the area have turned their backs on premium price low phos, leaving foundries to set the price. Consumption of purchased scrap has been cut from 65,000 to 35,000 by one large consumer with a new blast furnace in operation.

Buffalo—Price cuts of $4 to $5 a ton were confirmed by sales of about 12,000 tons to leading mill consumer. Further decline of $1 was posted on No. 1 heavy melting. Supplies are increasing and mills report large reserve stocks. Weakness dominates the market.

Boston—The New England market is almost completely devoid of action this week—the trade can't seem to sell anything. Prices, however, are maintained temporarily at last week's levels except for mixed cupola and heavy breakable, which are off $1, and unstripped motor blocks, which are off $5.25.

West Coast — Scrap market fell apart again last week worse than expected, as one major mill stopped buying for May and others cut down proportionately. In Los Angeles No. 1 heavy melting fell from $30 to a low of $24 and all other grades dropped at least $2. In San Francisco, the drop was not quite so bad with a $1 drop in No. 1 heavy melting and $3 on No. 1 bundles.

Scrap Prices

(Effective May 5, 1953)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	33.00 to 34.00
Machine shop turn	26.50 to 27.00
Mixed bor. and ms. turns.	26.50 to 27.00
Shovelling turnings	31.50 to 32.50
Cast iron borings	31.00 to 32.00
Low phos. punch'gs, plate	45.00 to 46.00
Heavy turnings	38.00 to 39.00
No. 1 RR. hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	45.00 to 46.00
Rails 2 ft and under	51.00 to 52.00
RR. steel wheels	51.00 to 52.00
RR. spring steel	51.00 to 52.00
RR. couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast	40.00 to 41.00
Heavy breakable cast.	38.00 to 39.00
Malleable	44.00 to 45.00

Chicago

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 factory bundles	38.00 to 39.00
No. 1 dealers' bundles	37.00 to 38.00
No. 2 dealers' bundles	33.00 to 34.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.50 to 19.50
Cast iron borings	18.00 to 19.00
Low phos. forge crops	45.00 to 47.00
Low phos. punch'gs, plate	41.00 to 43.00
Low phos. 3 ft and under	41.00 to 43.00
No. 1 RR. hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	45.00 to 47.00
Rerolling rails	47.00 to 48.00
Rails 2 ft and under	52.00 to 54.00
Locomotive tires, cut	47.00 to 48.00
Cut bolsters & side frames	47.00 to 48.00
Angles and splice bars	49.00 to 50.00
RR. steel car axles	53.00 to 54.00
RR. couplers and knuckles	47.00 to 48.00
No. 1 machinery cast.	43.00 to 45.00
Cupola cast	40.00 to 42.00
Heavy breakable cast.	35.00 to 36.00
Cast iron brake shoes	36.00 to 37.00
Cost iron car wheels	41.00 to 42.00
Malleable	41.00 to 42.00
Stove plate	35.00 to 37.00

Philadelphia Area

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	30.00 to 32.00
Machine shop turn.	27.00 to 28.00
Mixed bor., short turn.	31.00 to 32.00
Shoveling turnings	32.00 to 33.00
Clean cast chem. borings.	41.50 to 42.00
Low phos. 5 ft and under	43.50 to 44.50
Low phos. 2 ft and under	45.00 to 46.00
Low phos. punchings	45.50 to 46.50
Elec. furnace bundles	43.50 to 44.50
Heavy turnings	39.50 to 40.50
RR. steel wheels	49.00 to 50.00
RR. spring steel	49.00 to 50.00
Rails 18 in. and under	55.00 to 56.00
Cupola cast	39.00 to 40.00
Heavy breakable cast.	43.50 to 44.50
Cast iron carwheels	46.00 to 47.00
Malleable	46.00 to 47.00
Unstripped motor blocks.	29.00 to 30.00
No. 1 machinery cast.	47.00 to 48.00
Charging box cast.	40.00 to 41.00

Cleveland

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	38.00 to 39.00
No. 2 bundles	33.00 to 34.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. 2 ft and under	44.00 to 45.00
Drop forge flashings	38.00 to 39.00
No. 1 RR. hvy. melting	45.00 to 46.00
Rails 3 ft and under	52.00 to 53.00
Rails 18 in. and under	55.00 to 56.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	38.00 to 39.00
Railroad cast	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	43.00 to 44.00
Malleable	49.00 to 50.00

Youngstown

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. plate	47.00 to 48.00

Buffalo

No. 1 hvy. melting	$41.50 to $42.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 busheling	42.00 to 43.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	37.00 to 37.50
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	31.00 to 31.50
Shoveling turnings	32.00 to 32.50
Cast iron borings	27.00 to 28.00
Low phos. plate	44.00 to 45.00
Scrap rails, random lgth.	45.75 to 46.75
Rails 2 ft and under	51.75 to 52.75
RR. steel wheels	50.75 to 51.75
RR. spring steel	50.75 to 51.75
RR. couplers and knuckles	50.75 to 51.75
No. 1 machinery cast.	44.00 to 45.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 bundles, openhearth	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
Heavy turnings	28.00 to 29.00
New busheling	38.00 to 39.00
Drop forge flashings	38.00 to 39.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Electric furnace bundles.	39.00 to 40.00
Low phos. punch'gs, plate, heavy	43.50 to 44.50
Low phos. punch'gs, plate, light	40.00 to 41.00
No. 1 cupola cast	44.00
Heavy breakable cast.	40.00
Stove plate	41.00
Automotive cast.	48.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	30.00 to 31.00
No. 2 bundled sheets	29.00 to 30.00
Machine shop turn.	18.00 to 20.00
Shoveling turnings	20.00 to 22.00
Cast iron borings	15.00 to 16.00
Rails, random lengths	41.00 to 42.00
Rails 18 in. and under	52.00 to 54.00
Locomotive tires, uncut	45.00 to 46.00
Angles and spike bars	45.00 to 46.00
Std. steel car axles	50.00 to 52.00
RR. spring steel	46.00 to 48.00
Cupola cast	42.00 to 43.00
Hvy. breakable cast.	30.00 to 32.00
Cast iron brake shoes	39.00 to 40.00
Stove plate	38.00 to 39.00
Cast iron car wheels	46.00 to 47.00
Malleable	35.00 to 36.00
Unstripped motor blocks.	33.00 to 34.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	$29.00 to 30.00
No. 2 bundles	26.00 to 28.00
Low phos. 2 ft and less	36.00 to 37.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	21.00 to 22.00
Clean cast chem. borings	32.00 to 33.00
No. 1 machinery cast.	43.00 to 44.00
Mixed yard cast.	34.00 to 35.00
Charging box cast.	36.00 to 37.00
Heavy breakable cast.	36.00 to 37.00
Unstripped motor blocks.	23.00 to 24.00

Birmingham

No. 1 hvy. melting	$31.50 to $32.50
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	31.50 to 32.50
No. 2 bundles	27.00 to 28.00
No. 1 busheling	31.50 to 32.50
Machine shop turn.	20.75 to 21.75
Shoveling turnings	22.75 to 23.75
Cast iron borings	22.75 to 23.75
Electric furnace bundles	32.00 to 33.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft.	39.00 to 40.00
No. 1 RR. hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	45.00 to 46.00
Rails, 18 in. and under	45.00 to 46.00
Angles & splice bars	45.00 to 46.00
Std. steel axles	45.00 to 46.00
No.1 cupola cast.	38.00 to 39.00
Stove plate	34.00 to 35.00
Cast iron car wheels	46.00 to 47.00
Charging box cast.	30.00 to 31.00
Heavy breakable	30.00 to 31.00
Unstripped motor blocks.	34.00 to 35.00
Mashed tin cans	24.00 to 25.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.00 to $34.17
No. 2 hvy. melting	25.00
No. 1 bundles	30.00
No. 2 bundles	22.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and short turn.	20.00
Shoveling turnings	20.00
Clean cast chem. borings	31.17
Mixed cupola cast.	28.00 to 30.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	28.00 to 29.00
Unstripped motor blocks.	22.00

Cincinnati

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. 18 in. & under	46.00 to 47.00
Rails, random lengths	44.00 to 45.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast.	42.00 to 43.00
Hvy. breakable cast.	37.00 to 38.00
Drop broken cast.	49.00 to 50.00

San Francisco

No. 1 hvy. melting	$29.00
No. 2 hvy. melting	25.00
No. 1 bundles	26.00
No. 2 bundles	23.00
No. 3 bundles	19.00
Machine shop turn.	11.00
Cast iron borings	15.00
No. 1 RR. hvy. melting	37.00
No. 1 cupola cast.	$39.00 to $40.00

Los Angeles

No. 1 hvy. melting	$24.00 to $28.00
No. 2 hvy. melting	20.00 to 22.00
No. 1 bundles	23.00 to 25.00
No. 2 bundles	20.00 to 22.00
No. 3 bundles	18.00
Mach. shop turn.	8.00 to 10.00
Shoveling turnings	12.00 to 14.00
Cast iron borings	12.00 to 14.00
Elec. fur. 1 ft and under.	29.00
No. 1 RR. hvy. melting	37.00
No. 1 cupola cast.	39.00

Seattle

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	29.00
No. 1 bundles	32.00
No. 2 bundles	26.00
No. 1 cupola cast.	37.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	$35.50
No. 1 bundles	35.50
No. 2 bundles	35.00
Mechanical bundles	33.50
Mixed steel scrap	31.50
Bushelings	30.50
Bush., new fact. prep'd.	33.50
Bush., new fact. unprep'd.	32.50
Short steel turnings	32.50
Mixed bor. and turn.	32.50
Rails, remelting	35.50
Rails, rerolling	44.80
Cast scrap	50.00

Comparison of Prices

(Effective May 5, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	May 5 1953	Apr. 28 1953	Apr. 7 1953	May 6 1952
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.775¢	3.775¢	3.775¢	3.60¢
Cold-rolled sheets	4.575	4.575	4.575	4.35
Galvanized sheets (10 ga)	5.075	5.075	5.075	4.80
Hot-rolled strip	3.725	3.725	3.725	3.50
Cold-rolled strip	5.20	5.20	5.20	4.75
Plate	3.90	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Strains C-R strip (No. 302)	36.75†	36.75†	36.75†	36.75
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. ternes	7.75	7.75	7.75	7.50
Bars and Shapes: (per pound)				
Merchant bars	3.95¢	3.95¢	3.95¢	3.70¢
Cold finished bars	4.925	4.925	4.925	4.55
Alloy bars	4.675	4.675	4.675	4.30
Structural shapes	3.85	3.85	3.85	3.65
Stainless bars (No. 302)	31.50†	31.50†	31.50†	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
Wire: (per pound)				
Bright wire	5.225¢	5.225¢	5.225¢	4.85¢
Rails. (per 100 lb.)				
Heavy rails	$3.775	$3.775	$3.775	$3.60
Light rails	4.25	4.25	4.25	4.00
Semifinished Steel: (per net ton)				
Rerolling billets	$59.00	$59.00	$59.00	$56.00
Slabs, rerolling	59.00	59.00	59.00	56.00
Forging billets	70.50	70.50	70.50	66.00
Alloy blooms, billets, slabs	76.00	76.00	76.00	70.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.325¢	4.325¢	4.325¢	4.10¢
Skelp	3.55	3.55	3.55	3.35

† Add 4.7 pct to base and extras.

Composite: (per pound)				
Finished steel base price	4.376¢	4.376¢	4.376¢	4.131¢

	May 5 1953	Apr. 28 1953	Apr. 7 1953	May 6 1952
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$60.69	$60.69	$60.69	$58.19
Foundry, Valley	55.00	55.00	55.00	52.50
Foundry, Southern, Cin'ti	58.93	58.93	58.93	55.56
Foundry, Birmingham	51.38	51.38	51.38	48.88
Foundry, Chicago†	55.00	55.00	55.00	52.50
Basic del'd Philadelphia	59.77	59.77	59.77	57.27
Basic, Valley furnace	54.50	54.50	54.50	52.00
Malleable, Chicago†	55.00	55.00	55.00	52.50
Malleable, Valley	55.00	55.00	55.00	52.50
Ferromanganese‡	226.25	226.25	226.25	186.25

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ Average of U. S. Prices quoted on Ferroalloy pages.

Composite: (per gross ton)				
Pig iron	$55.26	$55.26	$55.26	$52.72
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$39.50	$39.50	$44.75	$48.00*
No. 1 steel, Phila. area	*40.50*	41.50	43.50	41.50*
No. 1 steel, Chicago	*36.50*	37.00	43.50	41.50*
No. 1 bundles, Detroit	*38.50*	40.25	40.50	41.15*
Low phos., Youngstown	47.50	47.50	49.50	46.50*
No. 1 mach'y cast, Pittsburgh	49.50	49.50	51.50	52.75
No. 1 mach'y cast, Philadel'a.	47.50	47.50	48.00	52.00*
No. 1 mach'y cast, Chicago	*44.00*	44.50	47.00	46.25

* Basing pt., less broker's fee. † Shipping pt., less broker's fee. Delivered prices, including broker's fee, unless otherwise noted.

Composite: (per gross ton)				
No. 1 heavy melting scrap	*$38.83*	$39.33	$43.92	$42.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.25	17.25	17.25	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.75‡	29.75‡	31.50‡	24.50
Copper, Lake, Conn.	....	....	33.25	24.625
Tin, Straits, New York	96.50†	96.50*	$1.11	$1.21½
Zinc, East St. Louis	11.00	11.00	11.00	19.50
Lead, St. Louis	12.30	11.80	12.80	16.80
Aluminum, virgin ingot	20.50	20.50	20.50	19.00
Nickel, electrolytic	63.08	63.08	63.08	50.58
Magnesium, ingot	27.00	27.00	27.00	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	44.00

† Tentative. ‡ Average. * Revised.

Composite Price Notes

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb, (2)6000 lb or over, (3)450 to 1499 lb, (4)2000 to 3999 lb.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A 4615 As rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	5.81	7.17	7.38-8.04	6.42	.....	6.05	6.47	6.41	7.18-7.43	.....	.....	.....	.....
Birmingham	.15	5.80	6.65	7.70[1]	5.80	.....	6.10	5.95	5.80	7.85	.....	.....	.....	.....
Boston	.20	6.45-6.52	7.35-7.71	8.34-8.39	6.55	8.50[2]	6.75-6.80	6.56	6.42-6.57	7.49-7.64	10.85	11.15-11.17	12.85	13.15-13.18
Buffalo	.20	5.77-5.80	6.60-6.65	8.31	6.00-6.21	.....	6.30-6.40	6.08-6.15	6.05	.....	10.70	11.00-11.07	12.70	13.00-13.07
Chicago	.20	5.80-5.81	6.65	7.90	5.83-5.84	.....	5.95-6.00	5.95	5.83	6.81-7.025	.....	10.65	.....	12.65
Cincinnati	.20	6.13	6.72	8.21	6.14	.....	6.47	6.42	.....	7.32	.....	11.07	.....	13.07
Cleveland	.20	5.80-5.81	6.65	7.54	6.00-6.01	.....	6.12-6.17	6.28	5.80-6.04	6.91-7.10	.....	10.79	.....	12.79
Denver	.....	7.17-7.39	8.23	9.60	7.43-7.69	8.90	7.37-7.54	7.50-7.80	7.61-7.71	8.24-8.48	.....	.....	.....	.....
Detroit	.20	5.99-6.00	6.81-6.90	8.59	6.13-6.34	7.29-7.85	6.45-6.47	6.42-6.69	6.12-6.47	7.23-7.32	10.72	.....	12.72	12.42-12.92
Houston	.20	6.35-6.74	7.00-7.78	8.62-8.70	6.70-6.95	.....	6.60-6.85	6.60-6.82	6.75-7.00	9.00-9.35	11.90	11.35-11.90	13.40	13.90
Kansas City	.20	6.47	7.31	8.62	6.51	.....	6.62-6.67	6.62	6.50	7.57	.....	11.32	.....	.....
Los Angeles	.20	6.60	8.45	8.45	6.70	9.15	6.70	6.60-9.40	6.60	8.60-9.40	.....	12.05	.....	14.40
Memphis	.10	6.56	7.40	.....	6.98	.....	6.71	6.71	6.59	7.77	.....	.....	.....	.....
Milwaukee	.20	5.97-6.16	6.82	8.07	6.00-6.20	.....	6.12-6.36	6.12-6.31	6.00	7.08-7.38	.....	10.82	.....	12.82
New Orleans	.15	6.28	7.12	.....	6.32	8.32	6.43	6.43	6.31	7.85	.....	.....	.....	.....
New York	.30	6.11-6.62	7.27-7.41	8.07-8.53	6.56-6.72	8.94	6.60-6.88	6.34-6.39	6.59-6.74	7.71-7.90	10.68-10.74	10.91-11.04	12.67-12.74	12.97-13.04
Norfolk	.20	6.75	.....	.....	7.30	.....	6.65	6.65	6.55	8.30	.....	.....	.....	.....
Philadelphia	.25	6.11	7.13	7.95-8.30	6.45-6.46	.....	6.24-6.28	6.17	6.62	.....	.....	10.67-10.79	.....	12.79
Pittsburgh	.20	5.80-5.81	6.65	7.90	5.94-5.97	.....	5.95-6.00	5.95	5.83-5.98	6.66-7.12	.....	10.65	.....	12.65
Portland	.20	7.80	9.05	9.15-9.30	7.50	.....	7.05	7.25	7.25	9.40	.....	.....	.....	.....
Salt Lake City	.20	8.30	.....	10.90[3]	8.45	.....	7.85	8.00	8.40	9.35[4]	.....	.....	.....	.....
San Francisco	.15	6.90	8.20	9.50	6.75	9.25-9.70	6.75	6.50	6.65	8.40-9.40	.....	12.05	.....	14.60
Seattle	.20	7.16-7.36	8.24-8.84	9.20-9.40	7.20-7.45	.....	7.04-7.19	6.63-6.83	7.08	9.37	.....	11.70	.....	13.70
St. Louis	.20	6.10-6.11	6.94-6.95	8.20	6.14	8.27-8.39	6.35-6.40	6.35	6.13	7.21-7.43	10.65	10.95	12.65	12.95
St. Paul	.15	6.47	7.31-7.61	8.56	6.50	.....	6.61-6.66	6.61	7.57	7.32-7.57	.....	11.31	.....	.....

Perfect Fit for a Filly

Another example of how Carpenter Application Engineering Service is working for industry

The average race track fan rarely gives a thought to the science that goes into pushing a winning horse across the finish line. The truth is that nothing—even down to the fit of a pony's shoes—is left to chance. And you'd be surprised at some of the problems encountered.

The horseshoe shown here is a good example. The manufacturer was using SAE 1060 steel to make the toe and heel calks. But when the shoe had to be bent cold for an exact fit on the horse's hoofs, the toe calk broke too often because the SAE steel couldn't take the bend.

And that's where Carpenter **A**pplication **E**ngineering **S**ervice went to work. The Carpenter representative demonstrated how Solar (Water-Tough) Tool Steel, engineered by Carpenter some years ago, will bend cold without breaking at a hardness of Rockwell C-58/60. Now, with Solar, not only is the breakage problem solved, but the life of a set of shoes more than doubled—going up from about three weeks to seven weeks!

Time and again manufacturers are finding new ways to make products work better, sell better, cost less . . . with the help of Carpenter **A**pplication **E**ngineering **S**ervice. A.E.S. goes to work as soon as you get in touch with your Carpenter Mill-Branch Warehouse or Distributor. Isn't it worth a try? THE CARPENTER STEEL CO., 121 W. Bern St., Reading, Pa.

Carpenter STEEL — **Tool, Alloy and Stainless Steels**

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

STEEL PRICES

(Effective May 5, 1953)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL-ING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$76.00 *B3*			3.90 *B3*	5.80 *B3*				
	Buffalo, N. Y.			$59.00 *B3*	$70.50 *B3, R3*	$76.00 *B3, R3*		4.675 *B3*	3.90 *B3*	5.80 *B3*	3.725 *B3, R3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.				$77.50 *A2*	$83.00 *A2*					4.125 *A2*		5.90 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$59.00 *B3*	$70.50 *B3*	$76.00 *B3*			3.90 *B3*	5.80 *B3*	3.725 *B3*			
	Newark, N. J.													
	New Haven, Conn.											5.60 *A5* 5.85 *D1*		
	Phoenixville, Pa.								4.95 *P2*					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.725 *B3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Worcester, Mass.													
	Trenton, N. J.											6.45 *R4*		
MIDDLE WEST	Alton, Ill.										4.20 *L1*			
	Ashland, Ky.										3.725 *A7*			
	Canton-Massillon, Ohio				$70.50 *R3*	$76.00 *R3* $78.60 *T5*								
	Chicago, Sterling, Ill.			$59.00 *U1*	$70.50 *U1, R3,W8*	$76.00 *U1, R3,W8*		4.675 *U1*	3.85 *U1, W8*	5.80 *U1*	3.725 *A1,W8* 4.725 *N4*	5.35 *A1*		
	Cleveland, Ohio				$70.50 *R3*							5.10 *A5,J3*		7.45 *J3*
	Detroit, Mich.	$56.00 *R5*	$57.00 *R5*		$73.50 *R5*	$79.00 *R5*					4.025 *G3* 4.40 *M2*	5.30 *G3* 5.45 *M2* 5.60 *D1* 6.05 *D2*	6.30 *G3*	8.15 *G3*
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			$59.00 *U1*	$70.50 *U1*	$76.00 *U1, Y1*		4.675 *I3*	3.85 *I3, U1*	5.80 *I3, U1* 6.30 *Y1*	3.725 *I3, U1,Y1*	5.35 *I3*	5.65 *I3, U1* 6.15 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.10 *A7*		
	Niles, Ohio Sharon, Pa.										4.225 *S1*	5.70 *T4* 5.80 *S1*	5.65 *S1*	7.30 *S1*
	Pittsburgh, Pa. Midland, Pa.	$54.00 *U1*	$57.00 *U1, C11*	$59.00 *U1*	$70.50 *U1*	$76.00 *U1, C11*	3.55 *U1* 3.65 *J3*	4.675 *U1*	3.85 *U1,J3*	5.80 *U1,J3*	3.725 *A7* 3.975 *A3* 4.225 *S7,S9*	5.10 *J3,A7* 5.45 *A3* 5.80 *B4,S7*	7.45 *J3*	
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.								4.10 *W3*		3.825 *W3*	5.10 *W3*	6.10 *W3*	7.95 *W3*
	Youngstown, Ohio					$76.00 *Y1, C10*	3.55 *U1, R3*			6.30 *Y1*	3.725 *U1, Y1,R3*	5.10 *R3,Y1* 5.70 *C5* 5.80 *B4*	5.65 *R3, U1* 6.15 *Y1*	7.30 *R3* 7.80 *Y1*
WEST	Fontana, Cal.	$81.00 *K1*	$83.00 *K1*	$78.00 *K1*	$89.50 *K1*	$95.00 *K1*			4.50 *K1*	6.45 *K1*	5.175 *K1*	7.00 *K1*	6.75 *K1*	
	Geneva, Utah				$70.50 *C7*				3.85 *C7*	5.80 *C7*				
	Kansas City, Mo.								4.45 *S2*		4.325 *S2*			
	Los Angeles, Torrance, Cal.				$89.50 *B2*	$96.00 *B2*			4.45 *C7,B2*	6.35 *B2*	4.475 *C7,B2*	7.15 *C1*	6.40 *B2*	
	Minnequa, Colo.								4.30 *C6*		4.775 *C6*			
	San Francisco, Niles, Pittsburg, Cal.				$89.50 *B2*				4.40 *B2* 4.56 *P9*	6.30 *B2*	4.475 *C7,B2*		6.40 *B2*	
	Seattle, Wash.				$89.50 *B2, S11*	$96.00 *S11*			4.50 *B2*	6.40 *B2*	4.725 *B2*		6.65 *B2*	
SOUTH	Atlanta, Ga.										4.275 *A8*			
	Fairfield, Ala. Alabama City, Ala.			$59.00 *T2*	$70.50 *T2*				3.85 *T2,R3*	5.80 *T2*	3.725 *T2,R3*		5.65 *T2*	
	Houston, Texas		$65.00 *S2*		$78.50 *S2*	$84.00 *S2*			4.25 *S2*		4.125 *S2*			

STEEL PRICES

(Effective May 5, 1953)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Coke* 1.25-lb. base box	Electro* 1.25-lb. base box	Holloware Enameling 29 ga.	
													Bethlehem, Pa.
3.775 *B3*	4.575 *B3*				5.675 *B3*	6.925 *B3*							Buffalo, N. Y.
										† Special coated mfg terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.			Claymont, Del.
													Coatesville, Pa.
4.175 *A2*					5.925 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.325 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
3.775 *B3*	4.575 *B3*	5.075 *B3*			5.675 *B3*	6.925 *B3*	7.775 *B3*		4.425 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.625 *A5*				Worcester, Mass.
									4.425 *R4*				Trenton, N. J.
									4.70 *L1*				Alton, Ill.
3.775 *A7*		5.075 *A7*	4.925 *A7*										Ashland, Ky.
		5.075 *R3*											Canton-Massillon, Ohio
3.775 *W8*					5.675 *U1*				4.325 *A5, N4, R3*				Chicago, Ill.
									4.425 *N4*				Sterling, Ill.
3.775 *R3, J3*	4.575 *R3, J3*		4.925 *R3*		5.675 *R3, J3*	6.925 *R3, J3*			4.325 *A5*				Cleveland, Ohio
3.975 *G3*	4.775 *G3*				6.225 *G3*	7.475 *G3*							Detroit, Mich.
													Duluth, Minn.
3.775 *I3, U1, Y1*	4.575 *I3, U1, Y1*	5.075 *I3, U1*	4.925 *U1*	5.475 *U1*	5.675 *I3, U1* 6.175 *Y1*	6.925 *I3, U1* 7.425 *Y1*				$8.70 *U1, I3, Y1*	$7.40 *U1, I3*	6.10 *U1, Y1*	Gary, Ind. Harbor, Indiana
4.30 *G2*	5.275 *G2*	5.275 *G2*	5.625 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
		5.475 *C9*											Kokomo, Ind.
	4.575 *A7*		4.925 *A7*	5.475 *A7*									Middletown, Ohio
4.175 *S1*					5.675 *S1*						$7.40 *R3*		Niles, Ohio Sharon, Pa.
3.775 *U1, J3, A7* 2.925 *A3*	4.575 *U1, J3, A7*	5.075 *U1*	4.925 *U1*		5.675 *U1, J3*	6.925 *U1, J3*	7.625 *U1*		4.325 *A5* 4.525 *P6*	$8.70 *U1, J3*	$7.40 *U1, J3*	6.10 *U1*	Pittsburgh, Pa. Midland, Pa.
									4.525 *P7*				Portsmouth, Ohio
3.775 *W3, W5*	4.575 *W3, W5*	5.075 *W3, W5*		5.475 *W3, W5*	6.025 *W3*	7.275 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.35 *W5*	Weirton, Wheeling, Follansbee, W. Va.
3.775 *U1, R3, Y1*	4.575 *R3, Y1*	5.775 *R1*	4.925 *Y1*	6.05 *E2*	5.675 *R3, U1* 6.175 *Y1*	6.925 *R3* 7.425 *Y1*		5.65 *E2* 5.825 *R1*	4.325 *Y1*	$8.70 *R3*			Youngstown, Ohio
4.825 *K1*	5.675 *K1*				6.775 *K1*	7.975 *K1*			5.125 *K1*				Fontana, Cal.
2.875 *C7*													Geneva, Utah
													Kansas City, Mo.
4.475 *C7*		5.825 *C7*						5.575 *C7*	5.125 *C7, B2*				Los Angeles, Torrance, Cal.
									4.575 *C6*				Minnequa, Colo.
4.475 *C7*	5.525 *C7*	5.825 *C7*							4.975 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.775 *T2, R3*	4.575 *T2*	5.075 *T2, R3*			5.675 *T2*			4.925 *R3*	4.325 *T2, R3*	$8.80 *T2*	$7.50 *T2*		Fairfield, Ala. Alabama City, Ala.
									4.725 *S2*				Houston, Tex.

IRON AGE

STEEL PRICES

(Effective May 5, 1953)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg's. Bright
EAST	Bethlehem, Pa.				4.675 *B3*	6.00 *B3*	5.925 *B3*					
	Buffalo, N. Y.	3.95 *B3,R3*	3.95 *B3,R3*	4.975 *B5*	4.675 *B3,R3*	6.00 *B3,B5*	5.925 *B3*	3.90 *B3*			5.95 *B3*	
	Claymont, Del.							4.35 *C4*		5.35 *C4*		
	Coatesville, Pa.							4.35 *L4*		5.75 *L4*		
	Conshohocken, Pa.							4.35 *A2*	4.95 *A2*		6.20 *A2*	
	Harrisburg, Pa.							6.50 *C3*	6.50 *C3*			
	Hartford, Conn.			4.475 *R3*		6.45 *R3*						
	Johnstown, Pa.	3.95 *B3*	3.95 *B3*		4.675 *B3*		5.925 *B3*	3.90 *B3*		5.25 *B3*	5.95 *B3*	5.225 *B3*
	Newark, N. J.			5.375 *W10*		6.35 *W10*						
	New Haven, Conn.											
	Camden, N. J.			5.375 *P10*		6.35 *P10*						
	Putnam, Conn.			5.475 *W10*								
	Sparrows Pt., Md.		3.95 *B3*					3.90 *B3*		5.25 *B3*	5.95 *B3*	5.325 *B3*
	Worcester, Mass.					6.35 *A5*						5.525 *A5*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.	4.50 *L1*										5.45 *L1*
	Ashland, Ky.							3.90 *A7*				
	Canton-Massillon	3.95 *R3*		4.925 *R2,R3*	4.675 *R3* 4.72 *T5*	5.99 *T5* 6.00 *R2,R3*						
	Chicago, Ill.	3.95 *U1,W8, R3* 4.55 *N4*	3.95 *R3* 4.70 *N4*	4.925 *A5,B5 W8,W10*	4.675 *R3, U1, W8*	6.00 *B5,L2, R3,W8,W10* 6.05 *A5*		3.90 *U1,W8*	4.95 *U1*	5.25 *U1*	5.95 *U1*	5.225 *A5, N4,R3* 5.325 *K2* 5.475 *W1*
	Cleveland, Ohio	3.95 *R3*	3.95 *R3*	4.925 *A5,C13*		6.00 *C13* 6.05 *A5*	5.925 *R3*	3.90 *R3,J3*	4.95 *J3*		5.95 *R3,J3*	5.225 *A5, C13,R3*
	Detroit, Mich.	4.10 *R5* 4.30 *G3*		5.075 *R5,P8* 5.175 *P3* 5.125 *P5*	4.825 *R5* 5.025 *G3*	6.15 *R5,P8* 6.20 *P3, B5*	6.675 *G3*	4.45 *G3*			6.90 *G3*	
	Duluth, Minn.											5.252 *A5*
	Gary, Ind. Harbor, Crawfordsville, Indiana	3.95 *I3, U1, Y1*	3.95 *I3, U1, Y1*	4.925 *L2, M5,R3*	4.675 *I3, U1, Y1*	6.00 *L2,M5, R3,R5*	5.925 *I3, U1,* 6.425 *Y1*	3.90 *I3, U1, Y1*	4.95 *I3*	5.25 *U1*	5.95 *I3, U1,* 6.45 *Y1*	5.325 *M4*
	Granite City, Ill.							4.60 *G2*				
	Kokomo, Ind.											5.325 *C9*
	Sterling, Ill.		4.80 *N4*									5.325 *N4*
	Niles, Ohio Sharon, Pa.							4.15 *S1*		5.70 *S1*	5.95 *S1*	
	Pittsburgh, Pa. Midland, Pa.	3.95 *U1, J3*	3.95 *U1, J3*	4.925 *A5, J3, W10,R3,C8*	4.675 *U1, C11*	6.00 *C8,C11, W10* 6.05 *A5*	5.925 *U1, J3*	3.90 *U1, J3*	4.95 *U1*	5.25 *U1*	5.95 *U1, J3*	5.225 *A5,J3* 5.475 *P6*
	Portsmouth, Ohio											5.625 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.10 *W3*						3.90 *W5* 4.20 *W3*				
	Youngstown, Ohio	3.95 *U1, Y1, R3*	3.95 *U1, Y1, R3*	4.925 *F2, Y1*	4.675 *U1, C10, Y1*	6.00 *C10,F2, Y1*	5.925 *U1* 6.425 *Y1*	3.90 *U1, Y1, R3*			5.95 *R3* 6.45 *Y1*	5.225 *Y1*
WEST	Fontana, Cal.	4.65 *K1*	4.65 *K1*		5.725 *K1*		6.175 *K1*	4.55 *K1*		6.30 *K1*	6.65 *K1*	
	Geneva, Utah							3.90 *C7*			5.95 *C7*	
	Kansas City, Mo.	4.55 *S2*	4.55 *S2*		5.275 *S2*							5.825 *S1*
	Los Angeles, Torrance, Cal.	4.65 *C7,B2*	4.65 *C7,B2*	6.375 *R3*	5.725 *B2*		6.625 *B2*					6.175 *C7,B1*
	Minnequa, Colo.	4.40 *C6*	4.75 *C6*					4.70 *C6*				5.475 *C6*
	San Francisco, Niles, Pittsburg, Cal.	4.65 *C7,P9* 4.70 *B2*	4.65 *C7,P9* 4.70 *B2*				6.675 *B2*					6.175 *C6,C7*
	Seattle, Wash.	4.70 *B2, S11*	4.70 *B2, S11*		5.725 *S11*		6.675 *B2*	4.80 *B2*			6.85 *B2*	
SOUTH	Atlanta, Ga.	4.50 *A8*	4.50 *A8*									5.475 *A8*
	Fairfield, Ala. Alabama City, Ala.	3.95 *T2,R3*	3.95 *T2,R3*				5.925 *T2*	3.90 *T2,R3*			5.95 *T2*	5.225 *T2, R3*
	Houston, Texas Ft. Worth, Texas	4.35 *S2*	4.35 *S2* 5.05 *T7*		5.075 *S2*			4.30 *S2*				5.625 *S2*

Steel Prices

(Effective May 5, 1953)

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Inc.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Lacledo Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.

R1 Reeves Stee & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co. Ft. Worth

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence 9-15½ ga. Col	Fence Posts Col	Single Loop Bale Ties Col	Twisted Barbless Wire Col	Galv. Barbed Wire Col	Merch. Wire Am'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*†	127	135	...	132	...	144	6.075	6.32‡
Aliquippa, Pa. *J3*	127	141	...	...	...	148	6.075	6.525
Atlanta *A8*	130	140	...	135	...	149	6.325	6.675
Bartonville *K2*	127	139	140	132	148	148	6.075	6.50
Buffalo *W6*	...	...	...	...	...	...	...	...
Chicago *N4*	127	136	...	132	145	145	6.075	6.375
Cleveland *A6*	...	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	...	6.075	6.225
Crawfordsville *M4*	127	138	...	132	...	147	6.175	6.475
Donora, Pa. *A5*	127	133	...	132	142	142	6.075	6.225
Duluth *A5*	127	133	...	132	142	142	6.075	6.225
Fairfield, Ala. *T2*	127	133	...	132	142	142	6.075	6.225
Galveston *D4*	135	...	...	...	...	...	...	...
Houston *S2*	135	147	...	...	...	156	6.475	6.925
Johnstn., Pa. *B3*	127	...	148	...	149	...	...	6.575
Joliet, Ill. *A5*	127	133	...	132	142	142	6.075	6.225
Kokomo, Ind. *C9*	...	...	142	...	...	...	6.175	6.425
Los Angeles *B2*	...	...	...	...	...	...	7.025	...
Kansas City *S2*	139	...	...	144	...	160	6.075	7.125
Minnequa *C6*	132	146	138	137	...	153	6.325	6.70
Moline, Ill. *R3*	...	...	136	...	...	...	...	...
Pittsburg, Cal. *C7*	146	156	...	156	162	162	7.825	7.175
Monessen *P6*	127	138	...	...	147	147	6.075	6.45
Portsmouth *P7*	132	...	...	...	...	...	6.47	...
Rankin, Pa. *A5*	127	133	...	...	142	142	6.075	6.225
So. Chicago *R3*†	127	135	140	132	...	144	6.075	6.325
S. San Fran. *C6*	...	...	...	153	...	167	7.025	7.40
Sparrows Pt. *B3*	129	...	...	134	151	...	...	6.675
Struthers, O. *Y1*‡	...	...	...	...	...	...	6.075	6.475
Torrance, Cal. *C7*	147	...	...	...	...	...	7.025	...
Worcester *A5*	133	...	...	...	...	...	6.375	6.525
Williamsport, Pa. *S10*	...	...	...	...	...	...	...	...

Cut Nails, carloads base $7.80 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa. (*A2*) Wheeling, W. Va (*W5*) $7.80.

† Zinc extra not included on Galv. Merch. Wire.

‡ Struthers Galv. Merch. Wire based on 15¢ Zinc.

STAINLESS STEELS

Base price, cents per lb., f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	15.50	16.50	18.00	17.50	26.75	21.75	23.50	13.50	16.25	13.75
Slabs, billets, rerolling	19.75	21.75	23.75	22.75	34.75	28.25	30.75	17.50	21.80	17.75
Forg. discs, die blocks, rings	36.75	37.00	39.75	38.50	57.25	43.50	48.25	30.00	30.50	30.50
Billets, forging	28.25	28.50	30.75	29.75	44.75	33.75	37.75	23.00	23.50	23.50
Bars, wires, structurals	33.75	34.00	36.50	35.50	53.00	40.00	44.75	27.50	28.00	28.00
Plates	35.75	35.75	38.00	38.00	56.00-56.25	44.00	49.00	28.75	29.75	29.25
Sheets	44.25	44.50	46.50	46.50	61.50	53.00	58.00	39.00	39.50	41.50
Strip, hot-rolled	28.50	30.50	35.00	32.75	52.50	40.00	44.50	25.00	32.75	25.75
Strip, cold-rolled	36.50	39.75	43.50	41.75	63.50	52.00	56.50	32.75	39.50	33.25

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2*; (type 316 add 4.5¢) *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I3*; Ft. Wayne, *J4*; Lockport, N. Y., *R4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa. *W2* (type 316 add 4.5¢); W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Lockport, N. Y., *S4*; Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7* Wallingford, Conn., *W1*

Bars: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa. *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y. *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Lockport, N. Y., *S4*; Canton, O., *T5*; Ft. Wayne, *J4*.

Wires: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*); Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Lockport, N. Y., *S4*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3* Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

Miscellaneous Prices

(Effective May 5, 1953)

PIPE AND TUBING

Base discounts f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½–3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. *B3*	30.5	8.25	33.5	12.25	35.5	15.75	36.5	16.25	37.0	17.25	37.5	17.75	38.0	18.25						
Youngstown *R3*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25						
Fontana *K1*	19.5	+2.75	22.5	1.25	25.0	4.75	25.5	5.25	26.0	6.25	26.5	6.75	27.0	7.25						
Pittsburgh *J3*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	24.0	2.25	27.0	5.75	29.0	7.75
Alton, Ill. *L1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25						
Sharon *M3*	32.5	9.25	35.5	13.25	38.0	16.25	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.25						
Pittsburgh *N1*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0		27.0		29.0	
Wheeling *W5*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25						
Wheatland *W4*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75						
Youngstown *Y1*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
Indiana Harbor *Y1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25						
Lorain *N2*	32.5	15.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. *B3*	30.25	9.5	34.25	13.5	36.25	17.0	36.75	17.5	37.25	18.5	37.75	19.0	38.25	19.5						
Youngstown *R3*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5						
Fontana *K1*	19.25		23.25		25.25		25.75		26.25		26.75		27.25							
Pittsburgh *J3*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	23.75	2.0	27.75	6.5	31.25	10.0
Alton, Ill. *L1*	29.25	8.5	33.25	12.5	35.25	16.0	35.75	16.5	36.25	17.5	36.75	18.0	37.25	18.5						
Sharon *M3*	32.25	10.5	36.25	14.5	38.25	17.5	38.75	18.0	39.25	18.5	39.75	19.0	40.25	19.5						
Pittsburgh *N1*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75		27.75		31.25	
Wheeling *W5*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5						
Wheatland *W4*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0						
Youngstown *Y1*	32.25	11.5	36.25	15.5	37.75	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	22.5	23.75	4.5	27.75	8.5	31.25	12.0
Indiana Harbor *Y1*	31.25	10.5	35.25	14.5	37.25	17.5	37.75	18.5	38.25	19.5	38.75	20.0	39.25	20.5						
Lorain *N2*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.0

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3¾ pts. higher discount. Buttweld jobbers' discount, 5 pct. St. Louis zinc price now 11.0¢.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$28.05
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	22.50
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beach Bottom *W5*		7.85	9.10	9.90	10.45	11.00	11.70
Brackenridge *A3*	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Granite City *G2*		8.55	9.80				
Ind. Harbor *I3*	7.35	7.85	9.10				
Mansfield *E2*	7.35	7.85	9.10	9.90			
Newport, Ky. *N5*	7.35	7.85	9.10	9.90	10.45		
Niles, O. *N3*	7.35	7.85					
Vandergrift *U1*	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Warren, O. *R3*	7.35	7.85	9.10				
Zanesville *A7*	7.35	7.85	9.10	9.90	10.45	11.00	11.70

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$110.30 to $113.80
6 to 24-in., del'd N.Y.	113.50 to 114.50
6 to 24 in., Birmingham	96.50 to 101.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	$128.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	23.93	28.14	23.19	27.28
	2½	12	32.17	37.83	31.19	36.67
	2	12	35.78	42.11	34.69	40.82
	3½	11	44.72	52.65	43.36	51.05
	4	10	55.52	65.31	63.83	63.32
National Tube	2	13	22.81	27.94	22.23	
	2½	12	31.28	38.31	30.51	
	3	12	35.87	43.93	34.98	
	3½	11	42.56	52.12		
	4	10	54.02	66.16		
Pittsburgh Steel	2	13		28.58		
	2½	12	32.16	36.19		
	3	12	36.87	44.93		
	3½	11	43.76	53.32		
	4	10		67.68		

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery
Bethlehem *B3*	56.50	57.00	57.50	58.00		
Birmingham *R3*	50.88	51.38				
Birmingham *W9*	50.88	51.38				
Birmingham *S5*	50.88	51.38				
Buffalo *R3*	54.50	55.00	55.50			
Buffalo *H1*	54.50	55.00	55.50			66.75
Buffalo *W6*	54.50	55.00	55.50			
Chicago *I4*	54.50	55.00	55.00	55.50		
Cleveland *A5*	54.50	55.00	55.00	55.50	59.50	
Cleveland *R3*	54.50	55.00	55.00			
Daingerfield, Tex. *L3*	50.50	51.00	51.00			
Duluth *I4*	54.50	55.00	55.00	55.50		
Erie *I4*	54.50	55.00	55.00	55.50		
Everett, Mass. *M6*		59.50	60.00			
Fontana *K1*	60.50	61.00				
Geneva, Utah *C7*	54.50	55.00				
Granite City, Ill. *K3*	56.40	56.90	57.40			
Hubbard, Ohio *Y1*	54.50	55.00	55.00			
Jackson, Ohio *J1,G1*						65.50
Minnequa *C6*	56.50	57.50	57.50			
Monessen *P6*	56.50					
Neville Island *P4*	54.50	55.00	55.00	55.50		
Pittsburgh *U1*	54.50			55.50		
Sharpsville *S3*	54.50	55.00	55.00	55.50		
Steelton *B3*	56.50	57.00	57.50	58.00	62.50	
Swedeland *A2*	58.50	59.00	59.50	60.00		
Toledo *I4*	54.50	55.00	55.00	55.50		
Troy, N. Y. *R3*	56.50	57.00	57.50	58.00	62.50	
Youngstown *Y1*	54.50	55.00	55.00	55.50		
N. Tonawanda, N. Y. *T1*		55.00	55.50			

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per ton net for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7*	5.80	7.65	8.25	10.20	12.50
Carnegie, Pa. *S9*		7.65	8.25	10.20	12.50
Cleveland *A5*	5.10	7.30	8.25	10.20	12.50
Detroit *D1*	6.45	7.50	8.10		
New Castle, Pa. *B4*	5.80	7.65	8.25	10.20	
New Haven, Conn. *D1*	6.70	7.60	8.20		
Sharon, Pa. *S1*	5.80	7.65	8.25	10.20	12.50
Trenton, N. J. *R4*		7.95	8.55	10.50	12.80
Warren, Ohio *T4*	6.20	7.65	8.25	10.20	12.50
Weirton, W. Va. *W3*	5.80	7.65	8.25	10.20	12.50
Worcester, Mass. *A5*	5.40	7.60	8.55	10.50	12.80
Youngstown *C5*		7.65	8.25	10.20	12.50

* Sold on Pittsburgh base.

Miscellaneous Prices

(Effective May 5, 1953)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	3.775	4.25	4.925	....	....	....	....
Chicago *R3*	....	....	....	6.65	....	....	....
Cleveland *R3*	....	....	....	....	....	....	....
Ensley *T2*	3.775	4.25	....	....	....	....	....
Fairfield *T2*	....	4.25	....	6.65	....	4.775	....
Gary *U1*	3.775	4.25	....	....	....	4.775	....
Ind. Harbor *I3*	3.775	....	4.925	6.65	....	4.775	....
Johnstown *B3*	....	4.55	....	....	....	....	....
Joliet *U1*	....	4.25	4.925	....	....	....	....
Kansas City *S2*	....	....	....	....	....	....	....
Lackawanna *B3*	4.075	4.55	5.075	....	....	4.925	....
Lebanon *B3*	....	....	....	6.80	....	....	....
Minnequa *C6*	4.075	5.05	5.075	6.80	....	4.925	10.00
Pittsburgh *R3*	....	....	....	....	....	....	....
Pittsburgh *O1*	....	....	....	....	....	....	....
Pittsburgh *P5*	....	....	....	....	....	....	....
Pittsburgh *J3*	....	....	....	6.65	....	....	....
Pitt'g, Cal. *C7*	....	....	....	....	....	4.925	....
Seattle *B2*	....	....	....	7.30	....	5.075	....
Steelton *B3*	4.075	....	5.075	....	....	4.925	....
Struthers *Y1*	....	....	....	6.65	....	....	....
Torrance *C7*	....	....	....	....	....	4.925	....
Youngstown *R3*	....	....	....	6.65	....	....	....

TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	31.0¢
6	4	2	6	—	96.5¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Add 4.7 pct to base and extras.

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*29.50	
Conshohocken, Pa. *A2*		*27.50
New Castle, Ind. *I2*	*29.77	*26.24
Nickel-carbon		
10 pct Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct Coatesville, Pa. *L4*	33.5	
No. 302 Stainless copper stainless, Carnegie, Pa. *A4*		77.00
Aluminized steel sheets, hot dip, Butler, Pa., *A7*		7.75

*Includes annealing and pickling, & sandblasting.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in In.	Length in In.	Cents Per lb.
	GRAPHITE	
24	84	18.70
17, 18, 20	60, 72	18.70
8 to 16	48, 60, 72	18.70
7	48, 60	20.50
6	48, 60	21.95
4, 5	40	22.53
3	40	23.68
2½	24, 30	24.26
2	24, 30	26.57
	CARBON	
40	100, 110	8.45
35	65, 110	8.45
30	65, 84, 110	8.45
24	72 to 104	8.45
20	84, 90	8.45
17	60, 72	8.45
14	60, 72	9.02
10, 12	60	9.30
8	60	9.58

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:

70% or more $43.00
60% or less 40.00

—Miscellaneous Prices—

(Effective May 5, 1953)

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq

	Pct Off List			
	Less Keg Reg.	K.	Less Keg Hvy.	K.
½ in. & smaller.	10	24	10	24
9/16 in. & ⅝ in.	8	21	1	16
¾ in. to 1½ in. inclusive	4	18	+4	12
1⅝ in. & larger.	2	17	+4	12

Nuts, Hot Pressed—Hexagon

½ in. & smaller.	22	33	18	30
9/16 in. & ⅝ in.	12	25	1	16
¾ in. to 1½ in. inclusive	8	21	+3	13
1⅝ in. & larger.	4	18	+3	13

Nuts, Cold Punched—Hexagon

½ in. & smaller.	22	33	18	30
9/16 in. & ⅝ in.	19	31	13	26
¾ in. to 1½ in. inclusive	15	27	8	21
1⅝ in. & larger.	2	17	+4	12

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller.	33	43	26	37
9/16 in. & ⅝ in.	27	38	19	31
¾ in. to 1½ in. inclusive	21	33	11	25
1⅝ in. & larger.	5	19	net	15
	Light			
7/16 in. & smaller	33	43		
½ in. thru ⅝ in.	26	37		
¾ in. to 1½ in. inclusive	18	30		

Stove Bolts — *Pct Off List*

Packaged, steel, plain finished 44½—10
Packaged, plain finish ..... 25½—10
Bulk, plain finish** 59*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Inc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets — *Base per 100 lb*

½ in. & larger $8.80

Pct Off List

7/16 in. and smaller 30

Cap and Set Screws

(In bulk) — *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	40
¾ in. thru 1 in. up to & including 6 in.	26
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	43
¾ in. thru 1 in. up to & including 6 in.	33
Milled studs	17
Flat head cap screws, listed sizes ...	12
Fillister head cap, listed sizes	7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	37

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	11	25
9/16 in. & ⅝ in. x 6 in. & shorter	15	27
¾ in. & larger x 6 in. & shorter	14	26
All diam. longer than 6 in...	8	22
Lag, all diam. x 6 in. & shorter	19	31
Lag, all diam. longer than 6 in.	16	28
Plow bolts	30	..

—Miscellaneous Prices—

(Effective May 5, 1953)

REFRACTORIES

Fire Clay Brick	*Carloads, per* 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.25)	$99.30
No. 1 Ohio	92.40
Sec. quality, Pa., Md., Ky., Mo., Ill.	92.40
No. 2 Ohio	83.15
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.60)	14.40

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$99.30
Childs, Pa.	103.95
Hays, Pa.	105.10
Chicago District	122.40
Western Utah	116.55
California	122.85
Super Duty, Hays, Pa., Athens, Tex., Chicago	116.65
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	17.30
Silica cement, net ton, bulk, Hayes, Pa.	19.60
Silica cement, net ton, bulk, Ensley, Ala.	18.45
Silica, cement, net ton, bulk, Chicago District	18.45
Silica cement, net ton, bulk, Utah and Calif.	25.95

Chrome Brick	*Per net ton*
Standard chemically bonded Balt., Chester	$86.00
Burned, Balt., Chester	80.00

Magnesite Brick	
Standard Baltimore	$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite	*St. ⅝-in. grains*
Domestic, f.o.b. Baltimore in bulk fines removed	$64.40
Domestic, f.o.b. Chewalah, Wash., in bulk	38.00
in sacks	43.70

Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$13.75

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices through June 30, 1953, delivery.

	Gross Ton
Openhearth lump	$10.95
Old range, bessemer	10.10
Old range, nonbessemer	9.95
Mesabi, bessemer	9.85
Mesabi, nonbesemer	9.70
High phosphorus	9.70

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on Dec. 31, 1952. Increases or decreases after such date are for buyer's account.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	10.9¢
Canadian sponge iron, del'd. in East	12.0¢
Domestic sponge iron, 98+% Fe, carloads lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	60.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	53.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper reduced	10.00¢ plus metal value
Cadmium, 100-199 lb.	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	33.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.9¢
Stainless steel, 316	$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh)	$5.50
Zinc, 10 ton lots	23.0¢ to 30.5¢

—Ferroalloy Prices—

(Effective May 5, 1953)

Ferrochrome

Contract prices, cents per pound, contained CR, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	34.50	0.20% C	33.50
0.10% C	34.00	0.50% C	33.25
0.15% C	33.75	1.00% C	33.00
2.00% C			32.75
65.69% Cr, 4-9% C			24.75
62-66% Cr, 4-6% C, 6-9% Si			25.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.14
9 to 11% C	1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.60
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O.	$225
F.o.b. Johnstown, Pa.	227
F.o.b. Sheridan, Pa.	225
F.o.b. Etna, Clairton, Pa.	228
F.o.b. Philo, Ohio	225

Add $2.80 for each 1% above 82% Mn, subtract $2.80 for each 1% below 78% Mn.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	12.45
Ton lots, packed	14.05

Ferroalloy Prices

(Effective May 5, 1953)

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$84.00	$85.00
Pgh. or Chicago	84.00	85.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	30.00
Ton lots	32.00
Less ton lots	34.00 to 37.00
Premium for hydrogen-removed metal	1.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30	31.50
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00. Add $1.055 per ton for each additional 0.50% Si up to and including 17%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

—Ferroalloy Prices—

(Effective May 5, 1953)

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
Carloads 9.90
Ton lots 11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.
Ton lots $4.90
Less ton lots 4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. $4.45

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 7.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B $5.25

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound ..... 50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.
ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B ..... .85
14 to 19% B 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... $1.00
No. 6 ..... 68¢
No. 79 ..... 50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots $1.46
Less ton lots 1.57

Nickel - Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered
Less ton lots $1.30

Silcas, contract basis, delivered.
Ton lots ..... 45.00¢

The Clearing House

NEWS OF USED AND REBUILT MACHINERY

Won't Talk . . . Used machinery business in the Chicago area was slow again this month. A few dealers preferred not to discuss the matter.

High business levels in the Midwest, coupled with a record number of new industrial starts in the first quarter, have kept rebuilding at a fair pace, and have helped the used machine tool market generally. But consensus is that used machine tool sales will continue to slip in the months ahead, and that prices will follow the same trend.

Late Models in Pool . . . Discussion of the proposed government tool pools has caused some concern. It is pointed out that a tool pool would in many cases carry heavy loads of special machines for defense work that were built as late as 1941, 1942, and 1943.

If the used machine tool dealer is forced into the same pattern he has followed during the Korean episode, he'll be left to market used tools of a much earlier vintage and will be bypassed by any government contractor who knows that he can pull newer tools out of a government pool for a pittance. This would mean that in the future a considerable amount of defense work would bypass Machinery Row.

Will Be Major Buyer . . . Despite this, the new government shell program has created some new subcontract lathe work. And with at least five new lines expected to come in, it appears that Ordnance will be the major defense tool buyer in the lathe field for at least several months.

Air Force engine contracts continue to be cut back, with a consequent further spreadout in the rate of Air Force buying.

Rebuilding Is Better . . . It appears that rebuilding of used machine tools has held up better than used tools, chiefly because of the continuing need to readapt heavy equipment to new jobs. But dealers are lowering their inventories of used equipment generally, and this applies to the dealer-rebuilders as well.

The Chicago Chapter of Machinery Dealers National Assn. is getting set for its annual golf tournament, which will be followed by a filet mignon dinner—an indication that business, while sliding, is not yet at the doldrum level. The golf tournament will be held May 21 at Itasca, Ill.

Cut Inventories . . . Used machinery dealers around Cleveland are sitting tight and paring their inventories as much as they possibly can. Business is still off about 30 pct from last year's level and the question of what's going to happen on defense spending is causing uncertainty.

There is plenty of buyer resistance in the area and late model tools continue to be as scarce as ever. But dealers say these difficulties wouldn't be so bad if they knew which way the cat was going to jump.

Haven't Unloaded . . . As things stand now they are bound by indecision. Civilian producers who were expected to start dumping later models onto the used market haven't made a move. They seem to feel that to do so would be a losing proposition from the tax point of view and are banking on a stretchout to preserve the life of tools now in operation.

An indication that business may get a little better is the probability that some of the larger companies in the Cleveland area will go ahead with their retooling plans. One firm is reported to be starting a $500,000 retooling program and dealers are hoping that some intermediate machines (1930-1940 models) will find their way into the used market.

The government's shell program should also help the market.